Ancient Indian History & Archeology(Ph.D)

1. The term Palaeolithic was introduced by
(A) Mortimer Wheeler (B) V.Godon Childe
(C) John Lubbock (D) Henry Delumle

2. Experiments in the realm of domestication of animals and cultivation of plants were made in which period?
(A) Lower Palaeolithic (B) Middle Palaeolithic
(C) Upper Palaeolithic (D) Mesolithic

3. Menhir is associated with which of the following cultures?
(A) Palaeolithic (B) Neolithic
(C) Chalcolithic (D) Megalithic

4. Who was the first Director General of Archaeological Survey of India?
(A) James Princep (B) Alexander Cunningham
(C) R. E. M. Wheeler (D) Sir John Marshal

5. Who introduced the principle of stratigraphy in Indian Archaeology?
(A) H. D. Sankalia (B) A. Cunningham
(C) Sir John Marshal (D) R. E. M. Wheeler

6. Which of the following Harappan civilization cities had houses with doors on the main street?
(A) Chanhudaro (B) Kalibanga
(C) Mohenjodaro (D) Lothal

7. Which of the following Vedas stated that, "war begins in the minds of men"?
(A) Rig Veda (B) Yajur Veda
(C) Sam Veda (D) Atharva Veda

8. Which of the following is synonymous with the second urbanization in ancient India?
(A) Stone Age (B) Copper Age
(C) Iron Age (D) Bronze Age

9. Who among the following was the first to have discovered and studied the Manuscript of Kautilya's *Arthashastra*?
(A) R. P. Kangle (B) K. A. Nilakantha Shastri
(C) R. Shamasastri (D) Patrick Olivelle

10. Which of the following inscriptions mentions Devanamapiya Piyadasi as Asoka?
(A) Sanchi Pillar Edict (B) Rupnath Rock Edict
(C) Bairat Rock Edict (D) Maski Rock Edict

11. The Kushana king Kanishka held a great Buddhist council under whose presidentship?
(A) Nagasena (B) Asvaghosha
(C) Vasumitra (D) Sangharaksha

12. The first anthropomorphic representation of Lord Buddha is found at:
(A) Sarnath (B) Bodhgaya
(C) Nagarjunakond (D) Gandhara and Mathura

13. Which of the following inscriptions refers to the erection of a Garuda Pillar by a Greek national?
(A) Eran Inscription (B) Sanchi Inscription
(C) Bharhut Inscription (D) Besnagar Inscription

14. Who assumed the title of *Ksitipasatapatih* (Lord of hundred kings)?
(A) Ashoka (B) Chandragupta II
(C) Samudragupta (D) Skandagupta

15. Who founded Vikramshila Mahavihar?
(A) Harshavardhan (B) Gopala
(C) Dharmapala (D) Baladitya

16. The Dhamek stupa is located at which of the following places?
(A) Kaushambi (B) Sarnath
(C) Bodhgaya (D) Sanchi

17. The Pallava rulers built temples by using which of the following stones?
(A) Sandstone (B) Granite
(C) Basalt (D) Schist

18. Which of the following Rashtrakuta kings made Manyakheta as his new capital?
(A) Dantidurg (B) Amoghavarsha I
(C) Govinda II (D) Govinda III

19. Who discovered Bhimbetka?
(A) H.D. Sankalia (B) Shyam Sundar Nigam
(C) Vishnu Shridhar Wakankar (D) Rajabali Pandey

20. Which of the following *Dharmasutras* describes sea voyage as a degrading act?
(A) Baudhayana Dhamasutra (B) Gautama Dharmasutra
(C) Vasishtha Dharmasutra (D) Apastamba Dharmasutra

21. Which of the following places was famous for cotton trade during the rule of the Chola dynasty?
(A) Tanjore (B) Kaveripattanam
(C) Kalingapattanam (D) Uraiyur

22. The *Padirruppattu* is a collection of poems in praise of
(A) Pandya Kings (B) Chera Kings
(C) Satavahana Kings (D) Chola Kings

23. Abhinavagupta was a famous Acharya of which of the following schools?
(A) Pasupata (B) Lingayat
(C) Kapalika (D) Pratyabhijna

24. The first inscriptional evidence of *sati* has been found in which of the following inscriptions?

(A) Vilsad Pillar Inscription (B) Bhitari Pillar Inscription
(C) Eran Pillar Inscription (D) Bhitargaon Inscription

25. Who is the author of the book, *The Oxford Companion to India Archaeology?*

(A) D. P. Agrawal (B) D. K. Chakrabarti
(C) H. D. Sankalia (D) B. N. Mukherjee

26. Research is a:

(A) Self-oriented process (B) Discovery oriented process
(C) Value oriented process (D) Passive process

27. Who of the followings define, 'research' as 'a systematized effort to gain knowledge'?

(A) F.W. Taylor (B) Redman and Mory
(C) Chifford Woody (D) D. Slesigner

28. Who among the following has given the statement that "Research is an honest effort carried out through insight"?

(A) Mouly (B) Cook
(C) Best (D) Watson

29. Research ethics do not include

(A) Objectivity (B) Subjectivity
(C) Honesty (D) Integrity

30. Which of the following is the first step in a research process?

(A) Selection of a topic (B) Formulating Research Problem
(C) Development of a Hypothesis (D) Preparation of a Bibliography

31. One of the essential characteristics of research is:

(A) Replicability (B) Generalizability
(C) Objectivity (D) Usability

32. The fundamental objective of research is to:

(A) summarize the ideas given by others
(B) publish research papers to improve ability
(C) get Ph. D degree for better opportunities in future
(D) create new knowledge and to understand the meaning of current knowledge

33. The 'sociogram' technique is used to study:

(A) Professional Competence (B) Vocational Interest
(C) Achievement Motivation (D) Human Relations

34. Longitudinal approach in research refers to:

(A) Short-term researches (B) long-term researches
(C) transverse researches (D) research on environment

35. The title of the research thesis should be:

(A) brief and meaningful (B) aesthetic and attractive
(C) scientific and logical (D) philosophical and ornamental

36. The bibliography should be arranged:

(A) according to the year of publication (B) according importance of the books
(C) alphabetically (D) logically

37. The study in which the investigators attempt to trace an effect is known as:

(A) Summative Research (B) Ex-post Facto Research
(C) Survey Research (D) Historical Research

38. Field-work based research is classified as

(A) Experimental Research (B) Historical Research
(C) Empirical Research (D) Descriptive Research

39. Research proposal is also called as

(A) an abstract (B) a summary
(C) a Synopsis (D) a Prologue

40. Data collected from published books and journals are called

(A) Primary data (B) Secondary data
(C) Conventional data (D) Tertiary data

41. In a research work reference serves the purpose of

(A) Providing ornamental value to the research

(B) Lending authenticity to the given content

(C) Exhibiting the great achievement of the research work

(D) Making insightful decision by the researcher

42. The method of research reporting should be

(A) Personal (B) Attractive
(C) Globalized (D) Scientific

43. In doing action research what is the useful sequence of steps?

(A) Plan, reflect, observe, act (B) Act, observe, plan, reflect
(C) Plan, act, observe, reflect (D) Reflect, observe, plan, act

44. *et al*. refers to:

(A) and others (B) and the following
(C) for example (D) and elsewhere

45. N.B. means:

(A) Compare (B) approximately
(C) Note well (D) Not known

46. *Op.cit*. refers to:

(A) In the same place (B) the text following
(C) in the work cited (D) here and there

47. Who of the following is the author of the work *The Historians Crafts?*

(A) Marc Bloch (B) Fernand Braudel
(C) Lucien Febvre (D) Lewis Mumford

48. Who is the author of the book *The Theory and Practice of History?*

(A) G. R. Elton (B) Fritz Stern
(C) E. H. Carr (D) Leopold von Ranke

49. Who is the author of *The Nature of History*?

(A) Arthur Marwick (B) Will Durant
(C) A. Appadorai (D) Arthur F. Wright

50. Who of the following is the author *the Idea of History*?

(A) John C.B. Webster (B) Patrick Gardiner
(C) R. G. Collingwood (D) Oswald Spengler

x-x-x

ROUGH WORK

Economics(Ph.D.)

1. Ridge lines can be defined as the:
(A) Loci of the Maximum Products (B) Loci of zero Marginal Products
(C) Loci of zero Total Products (D) Loci of zero Average Products

2. The process of negotiation between labor representatives and managers for deciding agreeable conditions of employment is called:
(A) Collective Bargaining
(B) Arbitrage
(C) Worker Participation in Management
(D) Compensation

3. An increase in imports:
(A) Has the same effect upon the multiplier as an increase in MPC
(B) Has no effect upon the multiplier
(C) Increases the value of multiplier
(D) Decreases the value of multiplier

4. The area where the members remove trade-barriers among themselves but keep their separate national barriers against trade with the outside world, is known as :
(A) Customs Unions (B) Common Market Area
(C) Economic Union (D) Free Trade Area

5. The Reference Period for the measurement of Neo-Natal Mortality Rate in India is :
(A) Three months after birth (B) Six months after birth
(C) 10 days after birth (D) 28 days after birth

6. Which of the following is considered as the third stage in the Rostow's stages of economic growth model?
(A) High mass consumption (B) Traditional society
(C) Pre-conditions for a take-off (D) Take-off

7. SDG ' Life Below Water' aims at conserving and sustainably using:
(A) Groundwater resources
(B) Wetland Ecosystem
(C) Oceans, Seas and Marine Resources
(D) Marshland Resources

8. The Concentration Theory of Tax Shifting and Incidence was developed by:
(A) Mercantilist (B) Physiocrats
(C) Australian School (D) Keynesians

9. A tax is levied at 10% on first Rs 10,000 of income, 15% on next 20,000 and 17% on next 30,000, this would be:
(A) Progressive (B) Degressive
(C) Regressive (D) Proportional

10. When supply of a commodity, for example agricultural commodities, react to price with a lag of one time period due to gestation period in production, such a phenomenon is referred to as:
(A) Lag phenomenon (B) Cobweb phenomenon
(C) Inertia (D) Business cycle

11. The 2022, Nobel Prize in Economics has been given to Philip H. Dybvig, Ben S. Bernanke and Douglas W. Diamond for their work on:
(A) Analysis of market power and regulation

(B) Analysis of markets with asymmetric information
(C) Research on banks and financial crisis
(D) Improvements to auction theory and inventions of new auction formats

12. Environmental Kuznets Curve shows the relationship between:
(A) Green GNP and GNP
(B) Natural Resources and Environmental Quality
(C) Natural Resources and Human Made Resources
(D) Environment Degradation and Income Per Capita

13. For complementary goods, the cross elasticity of demand will be:
(A) Zero (B) Infinity
(C) Positive but less than infinity (D) Negative

14. GNP at factor cost is equal to:
(A) GNP at Market Prices—Total Indirect Taxes + Subsidies
(B) GNP at Market Prices +Total Indirect Taxes — Subsidies
(C) GNP at Market Prices—Total Direct Taxes + Subsidies
(D) GNP at Market Prices—Total Direct Taxes ÷ Subsidies

15. The credit of developing the concept of Modern Economic Growth goes to?
(A) Arthur Lewis (B) Michael P. Todaro
(C) Gunnar Myrdal (D) Simon Kuznets

16. The Purchasing Power Parity Theory postulates that the change in exchange rate between two currencies is proportional to the change in the ratio in the two countries' _____
(A) Import duty (B) General price level
(C) Unemployment rate (D) Savings rate

17. The Gender Inequality Index is a composite index of:
(A) Reproductive Health, Empowerment and Labor Market Participation
(B) Reproductive Health, Adult Literacy Rate and Labor Market Participation
(C) Reproductive Health, Empowerment and Life Expectancy
(D) Reproductive Health, Life Expectancy and Adult Literacy

18. Match List - I with List - II:

List-I	List –II
(a) Rural-urban migration	(i) Arthur Lewis
(b) Economic development with unlimited supply of labour	(ii) Gunnar Myrdal
(c) Process of cumulative causation	(iii) Raul Prebisch
(d) Decline in terms of trade of primary commodities	(iv) Harris-Todaro

(A) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii) (B) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
(C) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii) (D) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

19. The total cost function of a firm is $C = \frac{1}{10}q^3 - 3q^2 + 50q + 300$, where C= Total cost, q= Output. What is the Marginal cost at q= 10?
(A) 20 (B) 10 (C) 30 (D) 50

20. 'Bandwagon Effect' is found in:
(A) Relative Income Hypothesis (B) Permanent Income Hypothesis
(C) Life Cycle Hypothesis (D) Absolute Income Hypothesis

21. Tele-MANAS Initiative, which was launched recently, is associated with which field?
(A) Child Health (B) Mental Health
(C) Communicable Diseases (D) Science and Technology

22. What is the rank of India in the International Intellectual Property Index 2023?
(A) 26 (B) 32 (C) 42 (D) 55

23. A good is called a 'Giffen Good' when the income effect is:
(A) Positive and is greater than the substitution effect
(B) Equal to substitution effect
(C) Less than substitution effect
(D) Negative and is greater than the substitution effect

24. Total utility is maximum when:
(A) Marginal utility is zero (B) Marginal utility is maximum
(C) Marginal utility increases (D) Average utility is maximum

25. Core inflation has been described as:
(A) Headline inflation — food inflation
(B) Headline inflation – (food inflation + fuel inflation)
(C) Headline inflation – fuel inflation
(D) Food inflation + fuel inflation

26. In a distribution of 10, 20, 30, 40, 50, the $\bar{X}$ is 30, the sum of deviations from $\bar{X}$ will be:
(A) 0 (B) 60 (C) 30 (D) 15

27. The ratio of the unexplained variation to total variation is defined as the coefficient of:
(A) Determination (B) Non-determination
(C) Dependency (D) None of these

28. Cross-cultural studies are an example of:
(A) Case study (B) Comparative study
(C) Experimental study (D) Cross-sectional study

29. Which type of variable is 'gender'?
(A) Continuous variable (B) Primary variable
(C) Dependent variable (D) Categorical variable

30. Selecting every sixth female entering the mall is an example of?
(A) Quota Sampling (B) Systematic Sampling
(C) Cluster Sampling (D) Simple Random Sampling

31. Lorenz curve is a graphical representation of:
(A) Variance (B) Dispersion
(C) Standard Deviation (D) Mean Deviation

32. The purpose of giving a _____ is to refer the reader to the source from which a quotation is taken:
(A) Citation (B) Footnote (C) Quote (D) Ident

33. A widely used format developed by Rensis Likert is useful for asking questions about:
(A) Attitude (B) Personality (C) Morale (D) None of these

34. Questions in which only two alternatives are possible is called:
(A) Multiple choice questions (B) Dichotomous questions
(C) Open ended questions (D) Unstructured questions

35. Identify the Independent Variable (IV) and Dependent Variable (DV) in this hypothesis: 'Running will increase a person's heart rate.'

(A) Increase (IV), Person (DV) (B) Increase (DV), Person (IV)
(C) Running (DV), Heart rate (IV) (D) Running (IV), Heart rate (DV)

36. Two types of errors associated with hypothesis testing are Type I and Type II. Type II error is committed when:

(A) The null hypothesis is rejected whilst the alternative hypothesis is true
(B) The null hypothesis is rejected when it is true
(C) The null hypothesis is not rejected when it is false
(D) Both B and C

37. Which scientific method focuses on testing hypothesis developed from theories?

(A) Deductive method (B) Inductive method
(C) Hypothesis method (D) Pattern method

38. The various steps in Research Process are given below. Place them in ascending order of the stages?

a. Data collection

b. Report writing

c. Data analysis

d. Problem formulation

Select the answer by using the codes given below:

(A) a, c, d and b (B) a, d, c and b
(C) d, a, c and b (D) c, a, d and b

39. The degree to which an instrument really measures what it intends to measure is called?

(A) Construct (B) Reliability (C) Validity (D) All of these

40. Binomial distribution approaches the normal distribution when the sample size_____

(A) Increases (B) Decreases
(C) Remains constant (D) None of these

41. Which of the following is NOT a style used for referencing?

(A) MLA (B) Chicago (C) APA (D) Munich

42. What are the core elements of a research process?

(A) Introduction; Data Collection; Data Analysis, Conclusions and Recommendations
(B) Executive Summary; Literature Review, Data Gathered, Conclusions; Bibliography
(C) Research Plan; Conclusions; Analysis; Research Data
(D) Introduction; Literature Review; Research Methodology; Results; Discussions and Conclusions

43. The value which divides a series into number of equal parts is called?

(A) Dividing values (B) Quartile values
(C) Partition values (D) Interpolation values

44. Snowball sampling is the process of selecting a sample using:

(A) Networks (B) Snowballs
(C) Computer Programs (D) None of these

45. The term *ibid* is often used while citing the reference for which of the following:

(A) To quote the work from a manuscript which has been communicated
(B) To quote the work from a book which is recently published
(C) To quote the work from the same source which has been mentioned in a previous reference
(D) To quote the work from the different source which has not been mentioned in earlier references

46. Tippet has prepared:

(A) Table of Lottery Numbers
(B) Table of Sampling Numbers
(C) Table of Systematic Numbers
(D) Table of Random Numbers

47. In the context of survey research, the following steps are taken in certain order, which of the following options represent correct order?

(I) Sampling
(II) Inference
(III) Data analysis
(IV) Data collection

Select the answer by using the codes given below:

(A) (II), (III), (I), (IV) (B) (I), (IV), (III), (II)
(C) (III), (II), (IV), (I) (D) (IV), (I), (II), (III)

48. In _____scale no initial point can be decided.

(A) Interval (B) Ratio (C) Ordinal (D) Nominal

49. The process of marking segments of data with symbols, descriptive words, or category names is known as_____.

(A) Concurring (B) Coding (C) Colouring (D) Segmenting

50. The geometric mean of the two regression coefficients is the:

(A) Coefficient of skewness (B) Covariance
(C) Coefficient of correlation (D) Coefficient of quartile deviation

X-X-X

History(Ph.D.)

1. Historical fact refers to:
(A) All facts about the past
(B) Facts on specific events
(C) Assumptions about the past
(D) Selected facts about the past

2. Evidence has to be:
(A) Reliable and genuine
(B) From government source only
(C) From newspaper only
(D) From fiction

3. Primary sources are:
(A) All sources on the theme
(B) Selected sources
(C) Contemporary sources from period selected
(D) Biographies only

4. Secondary sources are based on:
(A) Imagination of scholar
(B) Primary sources
(C) Non-government records
(D) Non-fiction account

5. The 19th century view of history believed that
(A) Facts had opinion
(B) Facts are not objective
(C) Facts are all important
(D) Facts have inbuilt interpretation

6. "Imaginative understanding" implies:
(A) Facts are pure
(B) Facts are part of dead past
(C) Historian has no role in selection of facts
(D) Facts are refracted through mind of recorder

7. Wickedness of Hegel refers to:
(A) Chance in history (B) Determinism (C) Causation (D) Laws in history

8. Hypotheses refers to:
(A) General statement of what would happen in a given situation
(B) Conclusion of research
(C) Fixed ideas or ideal type
(D) Lack of verification in research

9. Periodization implies:
(A) Permanent division of time in history
(B) Generalization
(C) Unchanging time structure
(D) No revision in time frame

10. Which of the following is not an objection to history being a science:
(A) Deals with unique
(B) Involves issues of morality
(C) Cannot predict
(D) Teaches lessons

11. Primary sources cannot be used:
(A) To settle any difference of opinion
(B) To find fresh facts
(C) To raise new questions
(D) To give interpretation

12. The purpose of a bibliography is to:
(A) Provide base for plagiarism
(B) Limit sources of study

(C) Give direction to research (D) Restrict information

13. Which of the following statements is incorrect about the Annales School:

(A) Provided new orientation to study history

(B) Introduced new methods

(C) Identified new sources

(D) Focused on traditional study of history

14. William Jones established the:

(A) India society (B) Asiatic society

(C) Pan Indian association (D) Asia study circle

15. Cleopatra's nose refers to:

(A) Role of women in history (B) Rational causes for an event

(C) Chance in history (D) Logic and reason

16. Quantitative history uses:

(A) Only good quality works (B) Only secondary sources

(C) Data and figures (D) Only primary record

17. Psychohistory is a branch of history:

(A) To study psychology (B) To study psychological events

(C) To study crazy personalities in history (D) To use psychology to study history

18. Historiography is the study of:

(A) History (B) Events (C) Historians (D) History writing

19. History is a science because:

(A) It uses observation (B) It utilizes many sources

(C) It uses the scientific method (D) It can be quantified

20. Objectivity in history is:

(A) Not possible (B) Against the nature of the subject

(C) Possible if enforced (D) Possible if scholar is conscious

21. Administrator historians were:

(A) In service of British government (B) Interested in administration

(C) Writers of administrative history only (D) None of these

22. Subaltern history focuses on:

(A) The grassroot level (B) The ruling class

(C) Economic history only (D) Trade and industry

23. In dealing with causation a scholar should:

(A) Use only some causes

(B) Select significant causes

(C) Discuss only 3 causes

(D) Include all known causes and give them proper sequence

24. Allied disciplines for a researcher mean:

(A) Social sciences (B) Natural sciences

(C) Engineering and medicine (D) Vocational disciplines

25. Folklore refers to:

(A) Traditional beliefs, myths, tales etc (B) Non-verbal sources

(C) Contemporary sources (D) None of these

26. Which sect in Buddhism does not believe in idol worship:

(A) Mahayana (B) Vajrayana (C) Hinayana (D) None of these

27. Which of the following dynasty was identified on the basis of coins:

(A) Gupta (B) Rashtrakuta (C) Kushana (D) Chalukya

28. Which of the following towns of the Harappan civilization were located on the Ghaggar:

(A) Harappa and Mohenjodaro (B) Kalibangan and Banawali

(C) Kalibangan and Harappa (D) Rangpur and Mohenjodaro

29. What was the main source of revenue in the Mauryan time:

(A) Land (B) Forest (C) Irrigation (D) None of these

30. What is the upveda of the Yajurveda:

(A) Shilpaveda (B) Dhanurveda (C) Ayurveda (D) Gandharvaveda

31. An old sun temple of pre-partition Punjab is located at:

(A) Multan (B) Amritsar (C) Jallandhar (D) Lahore

32. Jahangir's memoirs record that he called for Guru Arjan Dev because:

(A) He had supported the rebel Khusrau (B) He was collecting an army

(C) He wished to discuss issues (D) The Guru had sought a meeting

33. Tappa and Tope refers to:

(A) Types of cannons (B) Levels of administrative units

(C) Local groups for administration (D) Self-administering units

34. Small towns were all centres of:

(A) Collection and distribution of goods (B) Sociocultural significance

(C) Large scale manufacturing (D) Provincial capitals

35. Tazkira-i-pir Hassuteli is written by:

(A) Sheikh Hassan (B) Banarsi Das (C) Surat Singh (D) Hassan Shah

36. Which of the following is not a work of Amir Khusrau:

(A) Panj ganj (B) Nuh sipihir

(C) Deval Rani Khizar khan (D) Farhang-e-qawas

37. "Great Firm theory" elaborated on:

(A) Agrarian crisis in Mughal India

(B) Wars of succession

(C) Economic causes for decline of Mughal empire
(D) Structural flaws in Mughal system

38. Urban revolution in the 13th century refers to:
(A) Religious revolt in towns
(B) Increase in number and size of towns
(C) Destruction of towns
(D) Political change in towns

39. "Black acts" referred to:
(A) Wartime measures
(B) Roulatt act
(C) Government of India act 1919
(D) Government of India act 1935

40. Durand line was:
(A) Boundary established between Afganistan and British India
(B) Line demarcating east and west Bengal
(C) Line separating Pepsu and Punjab
(D) Line dividing eastern and western hill states

41. The Home Rule League intended to:
(A) Establish democracy
(B) Support violence to attain freedom
(C) Create an environment for independence
(D) Mobilize public opinion for self-government

42. The Ilbert Bill sought to allow:
(A) Indian judges to decide cases involving Indians
(B) British officers to control British non-government persons
(C) Senior Indian magistrates to preside over cases involving British subjects
(D) Indian magistrates to decide only civil cases

43. The Red Shirt movement was also called:
(A) Pashtoon movement
(B) Khudai Khidmatgar
(C) Labor movement
(D) Kisan movement

44. The Doctrine of Lapse was devised to:
(A) Recognize adopted heirs
(B) Decide cases of adoption in princely states
(C) Create conditions for appointing heirs
(D) Assert paramountcy over Hindu states

45. The Lee Commission was appointed to:
(A) Recommend reforms in education
(B) Consider racial composition of Indian public service
(C) Settle disputes between political parties
(D) Finalize service conditions

46. The Janamsakhis are:
(A) Written in the time of Guru Nanak
(B) Biographies of the Gurus
(C) Devotional literature
(D) Written in Sanskrit

47. Which of the following places in not in Doaba region:
(A) Jalandhar (B) Ambala (C) Kapurthala (D) Ludhiana

48. "Adalati" in the time of Ranjit Singh was:

(A) An administrative officer

(B) Touring justice

(C) Clerical person in judicial administration

(D) Assistant to Ulama

49. Balance of Trade implies:

(A) Imports exceed exports (B) Exports exceed imports

(C) Import and export is equal (D) There is only export

50. Sehejdhari refers to:

(A) A Sikh who observes Khalsa code (B) A Sikh who is baptized

(C) A non-Khalsa Sikh (D) None of these

x-x-x

ROUGH WORK

Political Science(Ph.D.)

1. For Locke, which of the following is not true in case of social contract?
   (A) Contract, once made, is irrevocable

   (B) Contract to which each generation must not consent

   (C) Contract in which men give up some of the rights they possessed in the state of nature

   (D) Contract does not put an end to the Law of Nature

2. For Rousseau, which one of the following is not true?
   (A) For man's self-love, which satisfies his real needs, is only too apt to become pride

   (B) Pride becomes incompatible with sympathy

   (C) From pride all evil has grown

   (D) Pride does not seduce reason

3. **Who among the following has written the article "The Zigzag of Politics"?**
   (A) John Rawls (B) H.A. Hayek (C) R. Nozick (D) J. Habermas

4. **Who among the following is not a proponent of communitarianism?**
   (A) Alasdair Maclntyre (B) Michael Sandel
   (C) Michael Walzer (D) Friedrich Hayek

5. **The Governor of a state in his capacity as Administrator of an adjoining Union Territory discharges his functions independently of:**
   (A) The President of India (B) The Union Cabinet
   (C) The Union Home Minister (D) The State Council of Ministers

6. **Who among the following described bureaucracy as "The continental nuisance"?**
   (A) Max Weber (B) Thomas Carlyle (C) M. Crozier (D) Karl Marx

7. **Which one of the following Commissions was not related to Backward Classes?**
   (A) Bakshi Commission (B) Mandal Commission
   (C) Havnoor Commission (D) Shah Commission

8. **Which of the following have been discussed as crisis of India's national unity by Paul R. Brass in his book The Politics of India since Independence?**
   (A) Punjab (B) The North East (C) Casteism (D) Kashmir

9. **Who describes Indian federation as a "holding together federation and not a 'coming together federation"?**
   (A) P. Bardhan (B) R.L. Watts (C) Douglas Verney (D) D.D. Basu

10. **Who calls Election Commission of India as an effective 'bulwark of free and fair elections'?**
    (A) Alistair McMillan (B) Lloyd and Susanne Rudolph

(C) R.P. Bhalla (D) M. Katju

11. Who of the following regard the Supreme Court of India as having a dual personality – a legal institution and a public institution?

(A) Granville Austin

(B) Upendra Baxi

(C) Madhav Khosla and Ananth Padmanabhan

(D) N. Robinson

12. Who among the following described comparative politics as primarily concerned with "parties, interests and leadership structure"?

(A) Gabriel Almond (B) Sigmund Neuman

(C) Roy C. Macridis and Ward (D) M.G. Smith

13. Who have argued that far from an objective reality, international politics is a 'World of our making'?

(A) Realists (B) Feminists (C) Idealists (D) Constructivists

14. Which one of the following is not part of five global commons?

(A) The High Seas (B) The Climate System

(C) The Deep Ocean floor (D) The Arctic region

15. Which one of the following pairs is mismatched?

Books	**Author**
(A) The wretched of the earth	Frantz Fanon
(B) World order	Henry Kissinger
(C) Implosion of Capitalism	Samir Amin
(D) Neo-Colonialism: The last stage of Imperialism	Julius Nyerere

16. Which one of the pairs is not correctly matched?

(A) Realism - States (B) Globalizm - Non state actors

(C) Dependency - Economic interests (D) Feminism – Gender

17. Who among the following had started two weeklies, the Karmayogin and the Dharma?

(A) Mahatma Gandhi (B) Aurobindo (C) Ranade (D) Tilak

18. Given below are two statements, one labelled as Assertion (A) and other as Reason (R):

Select the correct answer from the code given below:

Assertion (A): M.N. Roy did not accept Marx's materialistic interpretation of history.

Reason (R): It had an element of determinism and idealism.

Code:

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.
(D) (A) is false, but (R) is true.

19. Who among the following said in the context of States Reorganisation Commission Report: "The Lambs are shorn of the wool" and "They are feeling the intensity of cold"?
(A) J. Nehru (B) B.R. Ambedkar (C) B.N. Rau (D) K.T. Shah

20. Which of the following statements is not correct?
(A) Traditional political theory is prescriptive and normative
(B) Behavioural political theory concerned with uniformities and regularities
(C) Post-behavioural political theory is tied to action and relevancy
(D) Post-behavioural political theory is not holistic

21. Which one of the following contentions of Isaiah Berlin is not true in the context of resurgence of political theory (political philosophy)?
(A) Politics exists in a society where ends collide. In a liberal order political theory can never see its end.
(B) The responsibility for causing decline of political theory should be laid on rank empiricists who have displaced classical tradition.
(C) Political theory shall continue to exist as a result of the inquisitive and rational inquiry of man.
(D) He is sceptical about the resurgence of political theory (philosophy).

22. Who among the following conceived society as a 'Cooperative venture for mutual advantage', more or less self-sufficient, and necessarily governed by rules?
(A) Robert Nozick (B) Friedrich Hayek (C) John Rawls (D) Karl Marx

23. Who among the following has written the article "The Zigzag of Politics"?
(A) John Rawls (B) H.A. Hayek (C) R. Nozick (D) J. Habermas

24. Who among the following is not a proponent of communitarianism?
(A) Alasdair Maclntyre (B) Michael Sandel
(C) Michael Walzer (D) Friedrich Hayek

25. "If Hume and other English liberals hoped to use Congress as a safety-valve, the Congress leaders hoped to use Hume as a lightening-conductor". Who said this?
(A) S.R. Mehrotra (B) Sumit Sarkar
(C) Bipan Chandra (D) Tapan Raychaudhuri

26. Which of the following is the first step in starting the research process?
(A) Searching sources of information to locate the problem
(B) Survey of related literature
(C) Identification of the problem
(D) Searching for solutions to the problem

27. Manipulation is always a part of
(A) Historical research (B) Fundamental research
(C) Descriptive research (D) Experimental research

28. A null hypothesis is
(A) when there is no difference between the variables
(B) the same as research hypothesis
(C) subjective in nature
(D) when there is difference between the variables

29. The research which is exploring new facts through the study of the past is called
(A) Philosophical research (B) Historical research
(C) Mythological research (D) Content analysis

30. How can the objectivity of the research be enhanced?
(A) Through its impartiality (B) Through its reliability
(C) Through its validity (D) All of these

31. Action-research is:
(A) Applied research
(B) A research carried out to solve immediate problems
(C) A longitudinal research
(D) All the above

32. The research that applies the laws at the time of field study to draw more and more clear ideas about the problem is:
(A) Applied research (B) Action research
(C) Experimental research (D) None of these

33. When a research problem is related to heterogeneous population, the most suitable sampling method is:
(A) Cluster Sampling (B) Stratified Sampling
(C) Convenient Sampling (D) Lottery Method

34. The research is always
(A) verifying the old knowledge (B) exploring new knowledge
(C) filling the gap between knowledge (D) all of these

35. Formulation of hypothesis may NOT be required in:
(A) Survey method (B) Historical studies
(C) Experimental studies (D) Normative studies

36. Authenticity of a research finding is its:
(A) Originality (B) Validity (C) Objectivity (D) All of these

37. Which technique is generally followed when the population is finite?
(A) Area Sampling Technique (B) Purposive Sampling Technique
(C) Systematic Sampling Technique (D) None of these

38. The experimental study is based on:
(A) The manipulation of variables (B) Conceptual parameters
(C) Replication of research (D) Survey of literature

39. The main characteristic of scientific research is:
(A) empirical (B) theoretical (C) experimental (D) all of these

40. The study in which the investigators attempt to trace an effect is known as:
(A) Survey Research (B) 'Ex-post Facto' Research
(C) Historical Research (D) Summative Research

41. To test null hypothesis, a researcher uses:
(A) t test (B) ANOVA (C) X^2 (D) factorial analysis

42. Research problem is feasible only when:
(A) it has utility and relevance
(B) it is researchable
(C) it is new and adds something to knowledge
(D) all the above

43. What is the purpose of a research hypothesis?
(A) To summarize the research findings (B) To explain the research methodology
(C) To predict the outcome of the research (D) To describe the research participants

44. What is a dependent variable in a research study?
(A) A variable that is manipulated by the researcher
(B) A variable that is not affected by other variables
(C) A variable that is measured or observed in response to the independent variable
(D) A variable that is controlled by the research participants

45. What is the most common method of data collection in quantitative research?
(A) Interviews (B) Focus groups
(C) Observation (D) Surveys/Questionnaires

46. Which of the following statistical tests is used to determine if there is a significant relationship between two variables?
(A) T-test (B) ANOVA
(C) Correlation coefficient (D) Chi-square

47. A sampling technique in which units are randomly sampled from a population that has been divided into categories is called:
(A) Simple random sampling (B) Stratified random sampling
(C) Cluster random sampling (D) Systematic random sampling

48. What is a dependent variable in research?
(A) The variable that is manipulated by the researcher
(B) The variable that remains constant throughout the research
(C) The variable that is measured and observed
(D) The variable that is not relevant to the research question

49. What is a research design?

(A) A plan for data analysis

(B) A method for data collection

(C) A statistical technique

(D) A framework for conducting research

50. What is the purpose of statistical analysis in research?

(A) To summarize research findings

(B) To collect primary data

(C) To draw conclusion from data

(D) To develop research hypotheses

x-x-x

ROUGH WORK

Psychology(Ph.D.)

1. When a relevant subgroups of the population are randomly sampled in proportion to its size, it is –
(A) Random sample technique
(B) Stratified random sample technique
(C) Representative sample
(D) Cluster sample technique

2. The tendency of people to behave differently on being knowingly observed is called –
(A) Placebo effect
(B) Halo effect
(C) Horn effect
(D) Hawthorne effect

3. Which among the following measures of central tendency is most sensitive to extreme score ?
(A) Mean
(B) Median
(C) Mode
(D) Frequency distribution

4. When we say that the population mean is same as the sample mean, it signifies –
(A) research hypothesis
(B) alternative hypothesis
(C) experimental hypothesis
(D) null hypothesis

5. Type II error is made by the researcher when –
(A) The null hypothesis is true and the null hypothesis is rejected
(B) The null hypothesis is true and the null hypothesis is accepted
(C) The null hypothesis is false and the null hypothesis is accepted
(D) The null hypothesis is false and the null hypothesis is rejected

6. The probability of making a type II error is called –
(A) Alpha
(B) Beta
(C) Gamma
(D) Delta

7. the equality of two frequencies or proportions i.e. categorical data is measured by -
(A) t- test
(B) ANOVA
(C) Chi-square test
(D) Factorial design

8. Which of the following is a type of construct validity
(A) Convergent validity
(B) Criterion validity
(C) Content validity
(D) Concurrent validity

9. All else being equal, which of the following signifies strongest correlation
(A) -0.86
(B) -0.14
(C) +0.75
(D) 1.08

10. The design which concerns the question of how many times items are to be observed and how the information and data gathered is to be analysed is called –
(A) Sampling design
(B) Statistical design
(C) Observational design
(D) Operational design

11. Which scale of measurement has an arbitrary zero
(A) Ratio scale
(B) Interval scale
(C) Ordinal scale
(D) Nominal scale

12. Which of the following is not a type of primary data collection
(A) Observation
(B) Schedule
(C) Interview
(D) Historical documents

13. A data set has a positive skewness when,
(A) Mean<Median<Mode
(B) Mode<Median<Mean
(C) Mode=Median=Mean
(D) None of the above

14. Which of the following is not a type of nonparametric test
(A) Sign test
(B) Wilcoxon Signed Rank Sum Test
(C) Mann Whitney U test
(D) Pearson's Product Moment Correlation

15. When the size of a sample increases, the sampling error tends to -
(A) Remain the same/unaffected
(B) Increase
(C) Decrease
(D) None of the above

16. The null and alternative hypotheses in ANOVA (as in any hypothesis testing procedure) refers to
(A) Sample Statistics
(B) Population Parameters
(C) Sampling Parameters
(D) None of the above

17. If you conducted a study in which you randomly assigned people to two groups and tested them on a measure of attention, which statistical test would you use to determine whether the two groups differed on the measure of attention?
(A) Two-way analysis of variance
(B) One-way analysis of variance
(C) Independent t-test
(D) (B) and (C)

18. At a minimum, how many significance tests are conducted for a standard two-way ANOVA
(A) 3
(B) 2
(C) 1
(D) 4

19. A technique used to measure the meaning participants attach to various attitudinal objects or concepts is called
(A) The semantic differential technique
(B) The non-anchored rating scale
(C) The mutually exclusive response list
(D) Thurstone scale

20. A statistical technique that allows one to combine the findings from a number of studies and determine whether significant trends emerge is called
(A) Ethnographic analysis
(B) Discriminant statistical analysis
(C) Meta-analysis
(D) Path analysis

21. The purpose of grounded theory study is to
(A) Describe cultural characteristics
(B) Inductively generate a theory
(C) Describe one or more individual's experiences of phenomenon
(D) Describe one or more cases in depth

22. Which is true about this design: QUAL → QUAN
(A) It is an equal-status concurrent mixed methods research design
(B) It is an equal-status sequential mixed methods research design
(C) It is a dominant-status concurrent mixed methods research design
(D) It is a dominant-status sequential mixed methods research design

23. Standard deviation is
(A) A measure of variability in squared units
(B) A measure of control tendency
(C) The square root of variance
(D) All of the above

24. On the normal curve, the mean, median and mode are -
(A) The same
(B) Different
(C) The mean is greater than the mode
(D) The mean is less than the mode

25. In a simple regression, the regression coefficient tells you
(A) Variability in independent variable
(B) The point where the regression line crosses the X-axis
(C) The amount of change in the dependent variable associated with per unit change in the independent variable, while holding all other variable constant
(D) The amount of change in the independent variable per one unit change in dependent variable

26. Who among the following proposed that behavior is learned through imitation –
(A) Ivan Pavlov
(B) William McDougall
(C) B.F. Skinner
(D) Albert Bandura

27. Fritz Heider gave which of the given theories of Attitude
(A) Cognitive Dissonance theory
(B) Self-Perception theory
(C) Balance theory
(D) Persuasion theory

28. Which of the following theories was given by Leon Festinger
(A) Gate-control theory
(B) Drive reduction theory
(C) Cognitive Dissonance theory
(D) Theory of Reasoned Behaviour

29. When the likelihood to help in an emergency decreases because there are greater number of witnesses in an emergency, it is called
(A) Social influence
(B) Diffusion of responsibility
(C) Negative state relief
(D) Altruism

30. Who among the following used autokinetic effect for studying conformity and obedience
(A) Solomon Asch
(B) Muzafer Sherif
(C) Stanley Milgram
(D) Albert Bandura

31. Compliance with a small request increases the likelihood of compliance with a larger request is demonstrated by-
(A) That's- not-All technique
(B) Lowball techniques
(C) Foot-in-the-Door effect
(D) Door-in-the-Face effect

32. The tendency of decision making group to strive for consensus by not considering discordant information is called-
(A) Risky shift
(B) Group think
(C) Group polarization
(D) None of the above

33. Which of the following is not a style of leadership categorized by Lewin
(A) Laissez-faire
(B) Autocratic
(C) Democratic
(D) Bureaucratic

34. Discrimination form which component of prejudice –
(A) Affective
(B) Cognitive
(C) Behavioural
(D) None of the above

35. What are implicit attitudes?
(A) Attitudes which are consciously reportable
(B) Attitudes which are not consciously reportable
(C) Attitudes which are controllable
(D) Attitudes which are negative

36. Which of the following does not determine the strength of our attitudes
(A) Attitude extremity
(B) Attitude certainty
(C) Personal experience
(D) None of the above

37. The view that prejudice stems from direct competition between various social groups over scarce and valued resources is-
(A) Implicit associations
(B) Realistic conflict theory
(C) Social identity theory
(D) Threat to self-esteem theory

38. A type of conditioning in which the presentation of unconditioned stimulus (UCS) precedes the presentation of conditioned stimulus (CS) is called-
(A) Simultaneous conditioning
(B) Forward conditioning
(C) Backward conditioning
(D) Delay conditioning

39. In classical conditioning the stimulus that can evoke an unconditioned response the first time it is presented is-

(A) Unconditioned response
(B) Neutral stimulus
(C) Conditioned stimulus
(D) Unconditioned stimulus

40. In an organization, the employer checks the work of the employees at random periods of time. Therefore, the employees perform in a consistent manner to get appraisal. This is an example of which schedule of reinforcement?

(A) Fixed ratio schedule
(B) Variable ratio schedule
(C) Fixed interval schedule
(D) Variable interval schedule

41. Which of the followings are the Bottom-Up theories of perception?

i. Gibson's theory of Direct Perception
ii. Template theories
iii. Feature matching theories

(A) i and iii
(B) i and ii
(C) i only
(D) All of the above

42. Which of the following statements is incorrect?

(A) Dementia is an umbrella term for the loss of cognitive functions.
(B) Alzheimer's disease is a type of Dementia
(C) Alzheimer's disease is characterized by the deposition of abnormal lipids in the brain
(D) All are correct

43. Which of the following living beings don'ts how any signs of REM sleep?

(A) Humans (B) Dogs
(C) Cats (D) Lizards

44. The correlation between IQ scores and college grade point average is.5. What percent of the variation in college grades is accounted for by knowing IQ scores?

(A) 50
(B) 25
(C) 12.5
(D) 5

45. What is the primary function of the amygdale in the human brain?

(A) Motor control
(B) Language processing
(C) Emotion regulation
(D) Memory consolidation

46. Which defence mechanism involves channelling unacceptable impulses into socially acceptable behaviours?

(A) Sublimation
(B) Projection
(C) Repression
(D) Rationalization

47. Which stage of Erik Erikson's psycho-social development theory occurs during infancy (0 to 18 months)?
(A) Initiative vs. Guilt
(B) Trust vs. Mistrust
(C) Identity vs. Role Confusion
(D) Autonomy vs. Shame and Doubt

48. Which of the following neurotransmitters is primarily responsible for the "fight or flight" response?
(A) Dopamine
(B) Serotonin
(C) GABA (Gamma-Aminobutyric Acid)
(D) Norepinephrine

49. A tendency for people based in control group to put forth extraordinary effort in an attempt to outdo those in the experimental group is known as:
(A) Hawthorne Effect
(B) John Henry Effect
(C) Zeigarnic Effect
(D) All of the above

50. Which leadership style is characterized by low concern for both people and production?
(A) Laissez-faire leader ship
(B) Democratic leadership
(C) Transformational leadership
(D) Transactional leadership

x-x-x

Public Administration(Ph.D.)

1. Research Proposal means:
(A) Research Outline (B) Brief Outline of the research work to be done
(C) Research work itself (D) Abstract of the Research

2. Which of the following is not a characteristic of Scientific Method?
(A) Bounded Rationality (B) Objectivity
(C) Predictability (D) Verifiability

3. Who wrote the book 'Research Methods in Social Science'?
(A) Goode & Hatt (B) Kerlinger
(C) Nichamias & Nichamias (D) Kottari

4. Which of the following are the advantages of Observation as a method of Data collection?
1. Observation takes place only in natural setting
2. Observation method demands the active participation of subjects in the programme
3. Observations are known for directness
4. Artificiality can be minimized in Observational Studies
5. Recording devices can be used in Observational Studies for accuracy
(A) 1, 2, 3 Only (B) 1, 2, 5 Only (C) 2, 3, 4 Only (D) 3, 4, 5, Only

5. Objectivity in Research implies
(A) Exact judgment of truth (B) Findings consistent with reality
(C) Inter Researcher Agreement (D) Methodological Sophistication

6. Which of the following options will come first among the given steps of the Research Process below?
(A) Hypothesis Testing (B) Sampling
(C) Research Design (D) Data Analysis

7. **Statement-I:** After formulating the Research Problem the next task would be to conduct the Book Review.
Statement-II: A researcher may Review both kinds of literature i.e. conceptual and empirical literature.
Codes:
(A) Statement-I is correct, statement-II is incorrect
(B) Statement-I is incorrect, statement-II is correct
(C) Both statements-I and statement-II are correct
(D) Both statements-I and statement-II are incorrect

8. The Hypothesis that is introduced at the latter stages of research is known as
(A) Research Hypothesis (B) Null Hypothesis
(C) Statistical Hypothesis (D) Alternate Hypothesis

9. When the universe is vast and units are homogeneous, the best sampling method which can be adopted is?
(A) Random Sampling Method (B) Purposive Sampling Method
(C) Cluster Sampling Method (D) Stratified Sampling Method

10. Which of the following is a Non-Probability Sampling?
(A) Cluster Sampling (B) Stratified Sampling
(C) Simple Random Sampling (D) Snowball Sampling

11. Which of the following is not a quantitative method of data collection?
(A) Interview (B) Questionnaire (C) Correlation (D) Observation

12. Which of the following type of research do not require the formulation of Hypothesis?
(A) Experimental Studies (B) Survey
(C) Normative Studies (D) Longitudinal Studies

13. Which type of Research is concerned with the formulation of theory?
(A) Applied Research (B) Fundamental Research
(C) Action Research (D) Experimental Research

14. A tentative proposition with unknown validity that specifies a relationship between two or more variables is known as:
(A) Research Problem (B) Research Design
(C) Research Proposal (D) Research Hypothesis

15. The issue of research ethics is pertinent at which of the following stages of research?
(A) Identifying, defining and delimitation of research problem
(B) Defining the problem and sampling procedures & techniques
(C) Data Collection, Data Analysis and Reporting of the Research findings/result
(D) Deciding on qualitative or quantitative or both the paths to persue research problem

16. Which of the following scale of measurement had a fixed starting point and possesses a zero point or character of origin?
(A) Ratio Scale (B) Interval Scale (C) Ordinal Scale (D) Nominal scale

17. In an experimental research based study, the observation derived from which of the following variable is considered:
(A) Independent Variable (B) Dependent Variable
(C) Moderator Variable (D) Control Variable

18. Reliability of a retest refers to the
(A) Impartial Judgment of the Researcher (B) Clarity of the test items
(C) Fulfillment of the aims of the test (D) Consistency of Results

19. Which of the Following is a Positional Average?
(A) Mode (B) Median (C) Mean (D) Harmonic Mean

20. What is the full form of 'SPSS'?
(A) Systematic Package for the Social Sciences
(B) Statistical Program for the Social Sciences
(C) Sociological Package for the Social Sciences
(D) Statistical Package for the Social Sciences

21. A null hypothesis is
(A) Where there is no difference between variables
(B) The same as Research hypothesis
(C) Subjective in Nature
(D) When there is difference in Variables

22. Standard Deviation represents

(A) Central Tendency of Data (B) Probability
(C) Dispersion of Data (D) Correlation of data

23. Consider the following statement in context of Plagrism

1. Copying of your own work from one research to other amounts to Plagrism
2. If one wants to cite one's own work then there is no need to mention in references

Which of the following statement is correct?

(A) Only 1 (B) Only 2 (C) Both 1 & 2 (D) Neither 1 nor 2

24. The Research Design is

(A) A common method adopted by all researchers to carry out research
(B) The final Choice between using qualitative or quantitative methods
(C) Presentation of Research Findings
(D) A framework for every stage of the data collection and its Analysis

25. The Format of Thesis Writing is the same as in:

(A) Writing of Seminar Presentation
(B) A Research Dissertation
(C) Preparation of a Research Article
(D) Presentation of a workshop/Conference paper

26. British Concept of Civil Service Neutrality is laid down by:

(A) Fulton Committee (B) Masterman Committee
(C) Assheton Committee (D) None of these

27. The transfer of authority from Central Government to State Government in India implies:

(A) Delegation (B) Decentralization (C) Deconcentration (D) Devolution

28. Which of the following are not the Federal Features of Indian Constitution?

1. All India Service
2. Bicameral Legislature
3. Supremacy of the Constitution
4. Integrated Judiciary
5. Single Citizenship
6. Independent Judiciary

Select the correct options from the codes given below

(A) 1,4,6 (B) 1,3,5 (C) 1,4,5 (D) 1,5 only

29. Which Government for the first time sought to bring the Prime Minister of India within the orbit of inquiry by the Lokpal?

(A) Charan Singh Government (B) Rajiv Gandhi Government
(C) Chander Shekher Government (D) Morarji Deshai Government

30. Match List-I with List-II and select the correct answer by using the codes given below

	List-I	**List-II**
(a)	Training of IAS	1 New Delhi
(b)	Training of IPS	2 Dehradun
(c)	Training of Indian Forest Services	3 Mussoorrie
(d)	Training of Indian Foreign Services	4 Hyderabad

Codes

	(a)	(b)	(c)	(d)
(A)	3	4	2	1
(B)	2	3	1	4
(C)	2	4	3	1
(D)	1	3	4	1

31. In which year IAS Staff College Shimla and IAS Training School Delhi were clubbed together to form the National Academy of Administration:

(A) 1953 (B) 1956 (C) 1959 (D) 1961

32. Arrange the following committees on Civil Service Reforms in a chronological order and select the correct answer from the codes given below:

i) Hota Committee ii) Kothari Committee

iii) Yogendra Kumar Alagh Committee iv) Satish Chandra committee

Codes:

(A) i), iii), ii), iv) (B) iii), i), iv), ii) (C) ii), iv), iii), i) (D) iii), iv), ii), i)

33. Under which article of Constitution, District Planning Committee came into Existence:

(A) 243 ZD (B) 243 ZE (C) 244 ZD (D) 242 ZD

34. The chairman of which of the following Parliamentary Committee is invariably from the members of Ruling Party:

(A) Public Accounts Committee (B) Estimates Committee

(C) Committee on Delegated Legislation (D) Committee on Public Undertaking

35. The Sustainable Development Goal of 'Responsible Consumption and Production' comes at which serial number in the list of SDGs?

(A) 8^{th} (B) 10^{th} (C) 12^{th} (D) 13^{th}

36. The Governor of a State may be removed from the office by the President:

(A) On the Request of Chief Minister (B) On the Advice of Lok Ayukta

(C) On the Advice of Union Cabinet (D) On the Advice of Attorney General of India

37. Match List-I with List-II and select the correct answer by using the codes given below:

List-I	**List-II**
1. Sensitivity Training	(a) Chris Argyris
2. Participative Management	(b) Herbert Simon
3. Zone of Acceptance	(c) Chester Barnard
4. Zone of Indifference	(d) Likert

Codes

	(a)	(b)	(c)	(d)
(A)	2	3	4	1
(B)	2	3	1	4
(C)	1	3	2	4
(D)	4	3	2	1

38. Preparation of Budget in India is the responsibility of:

(A) Department of Revenue (B) Department of Budget

(C) Department of Expenditure (D) Department of Economic Affairs

39. Match List-I with List-II and select the correct answer by using the codes given below the lists

List-I	**List-II**
(a) Appleby Report	i) 1944
(b) Gorawala Report	ii) 1951
(c) Assheton Report	iii) 1953
(d) Fulton Report	iv) 1966

Codes

	a	b	c	d
(A)	ii)	i)	iii)	iv)
(B)	iii)	ii)	iv)	i)
(C)	ii)	iii)	iv)	i)
(D)	iii)	ii)	i)	iv)

40. Given below are two statements, one labeled as Assertion (A) and other labeled as Reason (R). Select the correct answer from the codes given below:

Assertion (A): The Courts follow the principle of Natural Justice while deciding the Cases.

Reason (R): Justice should not only be done but should manifestly be seen to be done.

Codes:

(A) Both A and R are true and R is the Correct explanation of A
(B) Both A and R are true and R is not the Correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

41. Which of the following article of the Indian Constitution provides for the post of Deputy Chief Minister?

(A) Article 153 (I) (B) Article 74 (C) Article 53 (I) (D) None of these

42. Arrange the following institutions of France government in ascending order

i) Region ii) Canton iii) Department iv) Arrondisements v) Commune

Select the correct answer from the codes given below:

Codes:

(A) i), iii), iv), ii) and v) (B) v), ii), iv), iii) and i)
(C) ii), v), iv), iii) and i) (D) iii), i), ii), v) and iv)

43. The Lakhina (Ahmednagar) experiment was related with:

(A) District Administration (B) Rural Administration
(C) Tribal Development (D) Revenue Administration

44. Which of the following did Herbert Simon emphasize?

1. Composite Decision Making
2. Means End Relationship
3. Illusion of Final Authority & Integrated Judiciary
4. Value-Fact Dichotomy

Select the correct options from the codes given below

(A) 1, 2, 3 (B) 2, 3, 4 (C) 2, 4 (D) 1, 2, 4

45. Match List-I with List-II and select the correct answer by using the codes given below

List-I	**List-II**
1. Reinventing Government	(a) Mooney Reiley
2. New Public Administration	(b) Vincent Osterom
3. The Intellectual Crisis in Public Administration	(c) George Fredrickson
4. Principles of Organization	(d) Osborne and Ted Gaebler

Codes

	(a)	(b)	(c)	(d)
(A)	3	3	4	2
(B)	4	3	2	1
(C)	2	4	3	1
(D)	4	1	2	3

46. Judicial Activism in India is the result of several factors, but the most important of them is:

(A) Political Corruption (B) Over Enthusiasm of the Courts
(C) Public Interest Litigation (D) Failure of Parliamentary Control

47. According to Daniel Lerner Public Policy Evaluation can be:

(A) Process Evaluation (B) Effect Evaluation
(C) Total Evaluation (D) All of these

48. Which one of the following is not a type of Public Private Partnership?

(A) BOT (Build-Operate-Transfer) (B) BMO (Build- Maintain- Transfer)
(C) BOO (Build-Own-Operate) (D) Boot (Build-Own-Operate-Transfer)

49. Regarding Public Policy, put the following in a sequential order:

1. Policy Formulation
2. Policy Implementation
3. Agenda Setting
4. Problem Recognition

Select the correct answer by using codes given below:

Codes:

(A) 2, 1, 3, 4 (B) 4, 3, 1, 2 (C) 3, 2, 4, 1 (D) 1, 3, 2, 4

50. Given below are two statements, one labeled as Assertion (A) and other labeled as Reason (R). Select the correct answer from the codes given below:

Assertion (A): M.P. Follet is the forerunner of Behavioural Approach to organizational analysis.

Reason (R): She stressed the sociological and psychological aspect of organizational behaviour.

Codes:

(A) Both A and R are true and R is the Correct explanation of A
(B) Both A and R are true and R is not the Correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

x-x-x

Sikh Studies(Ph.D.)

1. Research Methodology is;
(A) Outline of aims and objectives of research
(B) Systematic and valid design of research
(C) Method of writing the thesis
(D) Set of the techniques of research

2. According to C R Kothari types of research methodology are;
(A) 6 (B) 4 (C) 3 (D) 5

3. Qualitative and quantitative are;
(A) Research Methodologies (B) Research Methods
(C) Levels of research (D) Modes of data collection

4. The conceptual framework in which the research is carried out is called;
(A) Research design (B) Hypothesis
(C) Synopsis of research (D) Research paradigm

5. The systematic sampling is;
(A) Dividing total population by desired population
(B) Casually selection of data
(C) Selecting the data free from biases
(D) Separating the population in groups

6. Which of the following is priorly required to pursue the research?
(A) Developing a research design
(B) Formulating a research question
(C) Deciding about the data analysis procedure
(D) Formulating a research hypothesis

7. "Research is a systematic and objective analysis and recording of controlled observation."Is a Statement of;
(A) Clarke and Clarke (B) John. W. Best
(C) Clifford Woody (D) C S Kothari

8. In research term bibliography stands for;
(A) A list of Books read day to day life
(B) A list of Books available in library
(C) A list of Books to be collected to study
(D) A list of Books and other source material used in research

9. Which is not the core element of a research?
(A) Measurement of objective (B) Survey and data collection
(C) Reporting the research Plan (D) Discussions with public

10. The editors of 'The Routledge Handbook of Research Methods in the Study of Religion' are;

(A) Michael Stausberg and Steven Angler

(B) Jacques Derrida and Gianni Vatimo

(C) Arvind Pal Singh Mander and Anne Murphy

(D) Syed Waqas and Linda Woodhead

11. A hypothesis is;

(A) A statement whose validity cannot be verified

(B) An assumption based on some evidence

(C) An interpretation of facts and statements

(D) None of the above

12. What do you mean by synopsis of a research project?

(A) The blue print of research

(B) Extracts from the research observations

(C) The technique of the research

(D) Summary of the findings of research

13. The use of data in research may be;

(A) Qualitative only (B) Quantitative only

(C) Either 'A' or 'B' (D) Both 'A' and 'B'

14. Which of the following methods is required for the research in religious studies?

(A) Philosophical (B) Historical

(C) Theoretical (D) Combination of the above

15. Which of the following does not correspond to characteristics of research?

(A) Research is not passive (B) Research is systematic

(C) Research is not a problem-oriented (D) Research is not a process

16. What do you mean by research in Religious studies?

(A) Research into religious beliefs, behaviour and institutions.

(B) Research of religious differences and conflicts.

(C) Research into religions and power relations.

(D) Research in the religion and population ratio.

17. Who defined research as "systematized effort to gain new knowledge."

(A) Goode and Hatt (B) Redman and Mory

(C) F.W Taylor (D) Ross Taylor

18. Harjot Oberoi pursued his research in field of ;

(A) Anthropology (B) History (C) Religious Studies (D) Philosophy

19. Which of the following scholar has contributed to the study of Sufi tradition;

(A) Sant Singh Sekhon (B) Prof Harbans Singh

(C) Lajwanti Rama Krishna (D) Dr Balkar Singh

20. 'Travels of Guru Nanak' is written by;

(A) Christopher Shackle (B) Harpal Singh Pannu

(C) Surinder Singh Kohli (D) Sarbjinder Singh

21. The author of the book Violence and the Sikhs is;

(A) Arvind Pal Singh Mander (B) Gurinder Singh Mann

(C) Harjot Oberoi (D) Pashaura Singh

22. Dr. Kirpal Singh carried out his research on;

(A) Dasam Granth (B) Adi-Granth (C) Janam Sakhis (D) Gurmat Sangeet

23. Dr Gurnam Singh pursued his research in the discipline of ;

(A) Musicology of Guru Nanak (B) Poetics of Gurbani

(C) Philosophy of Sikhs (D) History of Punjab

24. Who had pursued his research in the field of Sikh Philosophy;

(A) Dr Avtar Singh (B) Dr H S Gill

(C) Dr H S Shan (D) Dr Ganda Singh

25. Shamsher Singh Ashok did his research work in the field of;

(A) Janam Sakhis (B) Gurmat Sangeet

(C) Collection of Manuscripts (D) Collection of Sikh art

26. Sri Guru Granth Sahib begins with the Raag.

(A) Malhar (B) Gaudi (C) Bilawal (D) Sri Raag

27. Book Guru Nanak ate Nirgun Dhara is authored by;

(A) Dr. Gurnam Singh (B) Prof. Tara Singh

(C) Dr. Prem Prakash Singh (D) Prof. Kishan Singh

28. How many banikar have used Rag Jayjaywanti;

(A) 6 (B) 3 (C) 5 (D) 1

29. Bani focused on metaphysical struggle of the self is;

(A) Anand Sahib (B) Asa di Vaar (C) Baramaha (D) Sukhmani

30. Bhai Gurdas used the poetic genre of ;

(A) Vaar and Baramaha (B) Vaar and Sweay

(C) Vaar and Qissa (D) Vaar and Parchian

31. 'Basant ki Vaar' is written by;

(A) Guru Nanak Dev (B) Guru Ram Das

(C) Guru Arjan Dev (D) Guru Angad Dev

32. Namdhari Sampardae is ;
(A) A sect of Sikhs (B) Independent religion
(C) School of Interpretation (D) A branch of Khalsa panth

33. Nasdiya Sukat is a part of;
(A) Righveda (B) Samveda (C) Yajurveda (D) Aathharveda

34. Prachin Panth Prakash is related with;
(A) History of Khalsa Panth (B) Life of Sikh Gurus
(C) Philosophy of Sikhs (D) Interpretation of Gurbani

35. How many Sikh Gurus contributed their *Bani* in Sri Guru Granth Sahib ;
(A) 6 (B) 10 (C) 8 (D) 9

36. The author of History of Religious Ideas is ;
(A) Swami Vivekananda (B) E B Tylor
(C) James Frazer (D) Mircea Eliade

37. "Religion is a belief system that has a supernatural being or God at its centre" is a statement of:
(A) Peter L. Berger (B) Max Weber
(C) E B Tylor (D) Emile Durkhiem

38. Who has associated the concept of ghosts and spirits with religion;
(A) Animism (B) Totemism (C) Monotheism (D) Polytheism

39. Which school of thought proposes that there are no universal religious or ethical laws?
(A) Existentialism (B) Marxism (C) Post Modernism (D)

Psychoanalysis

40. The Modernist study about religion never focuses on ;
(A) The revival of religion (B) The fall of religion
(C) Scientific construction of religion (D) Mythical construction of human mind

41. Which of the following does not fall in the five pillars of Islam;
(A) Murshad and Shariyat (B) Jihad and Zaqat
(C) Namaz and Roza (D) Haj and Zaqat

42. Martin Buber is a scholar of;
(A) Judaist theology (B) Islamic theology
(C) Christian theology (D) Zoroastrianism

43. Annata is a concept of;

(A) Jainism (B) Shaivism (C) Charvaka (D) Buddhism

44. The Jain scriptures are called;

(A) Agamas (B) Digambaras (C) Śvētāmbaras (D) Tirthankara

45. The main vows for monks of Jainism are;

(A) Ten (B) Six (C) Twelve (D) Five

46. Pashupata and Kapilika are the sect of ;

(A) Vaishnavism (B) Buddhism (C) Jainism (D) Shaivism

47. Tanakh is a religious book of ;

(A) Islam (B) Christianity (C) Judaism (D) Buddhism

48. Shia and Sunni are the sects of ;

(A) Judaism (B) Christianity (C) Islam (D) Zoroastrianism

49. The Sabads of Guru Ravi Das ji compiled in Sri Guru Granth Sahib are;

(A) 675 (B) 541 (C) 130 (D) 40

50. How many Raags are being used by Guru Ram Das ji;

(A) 19 (B) 36 (C) 31 (D) 30

x-x-x

ROUGH WORK

1. Which influential philosopher is often considered the father of positivism, emphasizing the idea that knowledge should be based on observable facts and empirical evidence?
(A) Immanuel Kant (B) Friedrich Nietzsche
(C) Auguste Comte (D) Jean-Jacques Rousseau

2. Interpretivism critiques positivism by asserting that:
(A) Social phenomena can be reduced to quantitative measures
(B) Human behavior is primarily determined by biological factors
(C) Context and culture are crucial in understanding human actions
(D) Empirical observations are the only valid source of knowledge

3. A population consists of 1000 individuals. If a researcher wants to achieve a 95% confidence level and a 3% margin of error, what is the minimum required sample size?
(A) 265 (B) 323 (C) 385 (D) 437

4. In a block design, the purpose of creating blocks is to:
(A) Randomly assign participants to groups
(B) Increase the number of conditions in the experiment
(C) Match participants on specific variables to reduce variability
(D) Manipulate the independent variable

5. Which approach emphasizes understanding a phenomenon from the perspective of the participants and acknowledging the researcher's influence on the study?
(A) Grounded theory (B) Ethnography
(C) Phenomenology (D) Reflexivity

6. Which of the following statements is true regarding hypotheses and propositions?
(A) Hypotheses are used in qualitative research, while propositions are used in quantitative research.
(B) Propositions are always stated in the form of "if-then" statements, while hypotheses are more general.
(C) Hypotheses are specific predictions about the outcome of a study, while propositions are general statements about relationships.
(D) Hypotheses are typically used in exploratory studies, while propositions are used in confirmatory studies.

7. What type of statistical operations can be performed on data measured using a ratio scale?
(A) Only descriptive statistics (B) Descriptive and inferential statistics
(C) Inferential statistics only (D) No statistical operations are applicable

8. A researcher collects data from a group of participants at three different time points: baseline, 6 months, and 1 year. This study design is an example of:
(A) Cross-sectional study (B) Case study
(C) Longitudinal study (D) Experimental study

9. Internal validity refers to the degree to which:
(A) The research findings can be generalized to a larger population

(B) The study accurately measures the variables of interest
(C) The study is free from external influences and biases
(D) The study accurately reflects the research design

10. In the context of questionnaire design, reliability refers to:
(A) The extent to which the questionnaire measures what it is intended to measure
(B) The consistency of scores obtained from the questionnaire over time
(C) The ability of the questionnaire to capture a wide range of responses
(D) The degree to which the questionnaire is free from measurement errors

11. What is the potential consequence of using leading questions in research?
(A) Participants might refuse to answer the questions
(B) The research findings may lack statistical significance
(C) Response bias and inaccurate data may result
(D) The sample size might become too small for analysis

12. The empirical rule (68-95-99.7 rule) states that for a normal distribution:
(A) 68% of the data falls within one standard deviation of the mean
(B) 95% of the data falls within three standard deviations of the mean
(C) 99.7% of the data falls within two standard deviations of the mean
(D) 68% of the data falls within three standard deviations of the mean

13. What is the term for the process of dealing with missing values in a dataset?
(A) Data visualization (B) Data preprocessing
(C) Data mining (D) Data validation

14. The formula for calculating the t-statistic in a two-sample t-test involves:
(A) The difference between the sample means and the population standard deviation
(B) The ratio of the sample means to the standard error of the difference between means
(C) The ratio of the sample means to the pooled standard deviation
(D) The product of the sample means and the sample size

15. If the p-value from a one-sample t-test is less than the chosen significance level (e.g., 0.05), what can you conclude?
(A) Reject the null hypothesis (B) Fail to reject the null hypothesis
(C) The test is inconclusive (D) Perform a chi-square test for independence

16. Conceptualization in theory building refers to:
(A) Testing the feasibility of a new theory in practice
(B) Measuring variables using numerical scales
(C) Defining and clarifying abstract ideas and concepts
(D) Comparing the new theory with existing theories

17. Grounded theory is an example of an inductive research approach. What is the primary aim of grounded theory?
(A) To test pre-existing theories
(B) To validate hypotheses using statistical analysis
(C) To develop a new theory grounded in empirical data
(D) To replicate previous research findings

18. Which of the following statements about skewness in univariate analysis is true?
(A) Positive skewness indicates that the distribution is perfectly symmetrical.
(B) Negative skewness indicates that the tail of the distribution is on the left side.
(C) Skewness measures the spread of data around the mean.
(D) A perfectly symmetric distribution has a skewness value of 0.

19. In bivariate analysis, the p-value associated with the Pearson correlation coefficient is used to:
(A) Measure the strength of the relationship between the variables
(B) Determine the direction of the relationship between the variables
(C) Assess the statistical significance of the relationship between the variables
(D) Estimate the effect size of the relationship between the variables

20. In multiple regression analysis, multicollinearity refers to:
(A) The presence of outliers in the data
(B) The lack of a linear relationship between variables
(C) The correlation between independent variables
(D) The distribution of residuals around the regression line

21. The process of data transformation in data processing includes:
(A) Removing outliers from the dataset
(B) Aggregating data to a higher level
(C) Disseminating the final results to stakeholders
(D) Collecting raw data from primary sources

22. The APA style is commonly used in academic writing for:
(A) Art and literature essays (B) Scientific and social science papers
(C) Business and marketing reports (D) Personal blog posts

23. How should the references in the reference list be organized in APA style?
(A) Alphabetically by the authors' first names
(B) Chronologically by the publication dates
(C) Alphabetically by the authors' last names
(D) Numerically by the order of citation in the paper

24. Which of the following is a correct way to formulate a hypothesis?
(A) "The participants will perform better."
(B) "There will be a change in the participants' behavior."
(C) "The mean scores of Group A and Group B will be different."
(D) "I think the results will show an effect."

25. What is the primary focus of bibliometric analysis?
(A) Analyzing the content and quality of scientific literature
(B) Identifying the most popular research topics in a specific field
(C) Investigating the relationships between authors' personal lives and their work
(D) Evaluating the design and methodology of research studies

26. What is the purpose of "horizontal analysis" when analyzing financial statements?
(A) Comparing financial ratios between companies in the same industry
(B) Comparing financial data over multiple periods to identify trends and changes

(C) Assessing the creditworthiness of customers
(D) Calculating the net present value of an investment project

27. What does the term "asset allocation" refer to in investment management?
(A) The process of selecting individual stocks for a portfolio
(B) The process of dividing an investment portfolio among different asset classes
(C) The analysis of market trends to predict stock price movements
(D) The calculation of the present value of future cash flows

28. What does the term "hedging" refer to in the context of international financial management?
(A) Investing in high-risk assets to maximize returns
(B) Taking a position to profit from expected currency movements
(C) Implementing strategies to offset potential losses from adverse currency movements
(D) Liquidating assets to repatriate funds to the home country

29. What is "co-payment" or "co-pay" in health insurance?
(A) The maximum coverage limit of the policy
(B) The amount the policyholder pays out-of-pocket for each medical service or prescription
(C) The discount provided by the insurer for early premium payment
(D) The monthly payment made by the insured to the insurer

30. Which of the following is included in the calculation of balance of payments but not in the calculation of balance of trade?
(A) Imports of goods
(B) Exports of goods
(C) Financial transactions such as foreign investments and loans
(D) The cost of raw materials used in manufacturing

31. What is "cognitive dissonance" in organizational behavior?
(A) A state of equilibrium between personal and professional life
(B) A feeling of discomfort caused by holding contradictory beliefs or attitudes
(C) A form of employee resistance to change
(D) The process of decision-making in a team

32. What role does "cognitive restructuring" play in stress management?
(A) Encouraging overthinking and rumination
(B) Accepting negative thoughts without questioning
(C) Identifying and changing negative thought patterns
(D) Promoting irrational beliefs for coping

33. What does the "PDCA cycle" stand for in the context of Total Quality Management?
(A) Plan-Do-Check-Act (B) Process-Demand-Control-Adjust
(C) Produce-Deliver-Correct-Adapt (D)People-Data-Communication-Achieve

34. In marketing, what does the term "positioning" refer to?
(A) The physical location of a product in a store

(B) The strategy to appeal to a broad audience
(C) Shifting a product's price point
(D) Creating a unique and favorable perception of a product in consumers' minds

35. What is the primary purpose of a "Call to Action" (CTA) in marketing?
(A) To provide information about the company's history
(B) To encourage users to take a specific action
(C) To list product features and specifications
(D) To display customer testimonials

36. Which brand strategy involves positioning a brand as the most expensive option in the market?
(A) Economy pricing (B) Prestige pricing
(C) Value-based pricing (D) Penetration pricing

37. What does the term "bullwhip effect" refer to in supply chain management?
(A) A sudden increase in demand for a product
(B) The amplification of demand fluctuations along the supply chain
(C) A shipping delay caused by weather conditions
(D) A sudden drop in supplier performance

38. What is "shrinkage" in retail management?
(A) The expansion of retail store space
(B) The practice of offering discounts to attract customers
(C) The difference between recorded and actual inventory due to theft, damage, or errors
(D) The fluctuation of customer traffic throughout the day

39. What type of business environment analysis focuses on the specific industry a company operates in?
(A) Macro environment analysis (B) PESTEL analysis
(C) Competitive environment analysis (D) Micro environment analysis

40. What strategy involves using a combination of standardized products and localized marketing approaches?
(A) Localization strategy (B) Export strategy
(C) Global standardization strategy (D) Transnational strategy

41. How does the "SWOT" analysis differ from the "Five Forces" analysis when examining the external environment?
(A) SWOT focuses on internal factors, while Five Forces focuses on external industry factors.
(B) SWOT assesses social and technological factors, while Five Forces assesses political and economic factors.
(C) SWOT analyzes competitive rivalry, while Five Forces analyze an organization's strengths.
(D) SWOT considers macro-environmental factors, while Five Forces consider micro-environmental factors.

42. In the context of search engine optimization (SEO), what is "long-tail keyword targeting"?

(A) Focusing on short and concise keywords for better visibility
(B) Targeting keywords that are lengthy and complicated
(C) Concentrating on keywords related to long articles and blog posts
(D) Optimizing content for specific, less common, and more specific search queries

43. What is "omnichannel retail" in the context of ecommerce?

(A) The process of selling products exclusively through social media platforms
(B) Offering a seamless shopping experience across various online and offline channels
(C) Restricting online sales to a single platform for better control
(D) Focusing solely on in-store shopping to enhance customer interaction

44. Which data mining technique focuses on classifying data into predefined categories?

(A) Clustering (B) Regression (C) Classification (D)Anomaly detection

45. What concept refers to a situation where a firm produces the quantity of output where marginal cost equals marginal revenue?

(A) Perfect competition (B) Monopolistic competition
(C) Monopoly equilibrium (D) Profit maximization

46. What does the "residual claimant theory of profit" propose?

(A) Profits are distributed equally among all factors of production
(B) Entrepreneurs receive profits due to their risk-taking after all other costs are paid
(C) Profit is determined solely by the demand and supply of goods
(D) Government intervention determines profit distribution

47. What is the "precautionary motive" for holding money?

(A) To earn interest income
(B) To make speculative investments
(C) To satisfy routine transaction needs
(D) To have a buffer against unexpected expenses

48. Which of the following represents the formula for calculating the expected time (TE) in PERT?

(A) (Optimistic time + Pessimistic time + 4 × Most likely time) / 6
(B) (Optimistic time + 4 × Pessimistic time + Most likely time) / 6
(C) (Optimistic time + 2 × Pessimistic time + Most likely time) / 4
(D) (Optimistic time + Pessimistic time + Most likely time) / 3

49. What does the "minimax" strategy aim to do in game theory?

(A) Minimize the maximum potential gain
(B) Minimize the maximum potential loss
(C) Maximize the minimum potential gain
(D) Maximize the minimum potential loss

50. What is the primary objective of replacement models in operations management

(A) Maximizing the utilization of existing assets

(B) Minimizing the frequency of replacements
(C) Maximizing the profit from asset resale
(D) Minimizing the total cost of ownership over time

x-x-x

ROUGH WORK

Physical Education(Ph.D)

1. What is the standard deviation of a sampling distribution called?
(A) Sampling error (B) Sample error (C) Standard error (D) Simple error

2. Split-Half method is used to established:
(A) Validity (B) Reliability (C) Norms (D) Objectivity

3. Which is the most reliable measure of variability, when the mean is used as the measure of central tendency?
(A) Standard Deviation (B) Mean Deviation
(C) Range (D) Quartile Deviation

4. Law of readiness, law of exercise and law of effect are propounded by:
(A) Cattle (B) Pavlov (C) Thorndike (D) Glelio

5. Health-related fitness components include all of the following EXCEPT:
(A) Flexibility (B) Agility
(C) Body composition (D) Muscular Strength

6. Which among them are non-parametric test
(A) Chi-square (B) 't'-test (C) ANOVA (D) ANCOVA

7. External and internal criticism is done in
(A) Experimental research (B) Historical research
(C) Philosophical research (D) Survey method

8. The statement of purpose in a research study should:
(A) Identify the design of the study
(B) Identify the intent or objective of the study
(C) Specify the type of people to be used in the study
(D) Describe the study

9. A good way to get a small standard error is to use a _____.
(A) Repeated sampling (B) Small sample (C) Large sample (D)Large population

10. Which of the following is not a type of reliability?
(A) Test-retest (B) Split-half (C) Content (D) Internal consistency

11. The denominator (bottom) of the z-score formula is
(A) The standard deviation (B) The difference between a score and the mean
(C) The range (D) The mean

12. If a distribution is skewed to the left, then it is ____.

(A) Negatively skewed (B) Positively skewed

(C) Symmetrically skewed (D) Symmetrical

13. Olympic Flag was hoisted first time in the year:

(A) 1896 (B) 1918 (C) 1920 (D) 1926

14. _____ results if you fail to reject the null hypothesis when the null hypothesis is actually false.

(A) Type I error (B) Type II error (C) Type III error (D) Type IV error

15. During which year the International Olympic Committee was formed

(A) 1895 (B) 1896 (C) 1892 (D) 1894

16. The Head Quarter of International Olympic Committee is at:

(A) Paris (B) Stockholm (C) Lausanne (D) New York

17. The first National Sports Policy was introduced

(A) 1984 (B) 1992 (C) 2002 (D) 2007

18. Symbol X^2 represents:

(A) Standard deviation (B) Chi-square (C) Variance (D) Quartile deviation

19. To measure the agility of the performance in changing body position rapidly by jumping

(A) Sergeant jump (B) Quadrant jump (C) Shuttle run (D) Harvard step jump

20. Bass stick test is used for measuring

(A) Strength (B) Agility (C) Coordination (D) Balance

21. Dyer test is associated with

(A) Athletics (B) Badminton (C) Football (D) Tennis

22. Which of the following technique is used for genetic research

(A) Survey (B) Longitudinal (C) Electromyography (D) Hypnosis

23. Action Research:

(A) Develops theories by tentative principles

(B) Gives accurate account of past events

(C) Is critical thinking

(D) To solve problems that has a direct application

24. Hypothesis is a:

(A) Suppositions (B) Established fact (C) Proven event (D) True principle

25. A choice the researcher makes to effect a workable research problem is called:
(A) Delimitations (B) Limitations (C) Assumptions (D) Definition

26. Vertical jump, chinning and shuttle run are the test items of
(A) JCR Test (B) Mc Cloys Test (C) IOWA Test (D) Kraus Weber Test

27. In the heterogeneous class, a physical education teacher must take into consideration
(A) Time available (B) Level of school
(C) Background of the student (D) Age of the students

28. Curriculum construction in physical education depends upon
(A) Aim and objectives of physical education
(B) Nature of individuals
(C) Facilities, time available and financial source
(D) Needs and characteristics of individuals

29. Who constructed Harvard step test
(A) Tuttle (B) Hart (C) Cureton (D) Brouha

30. Which of the following instruments measures the wind speed?
(A) Anemometer (B) Stadiometer (C) Galvanometer (D) Ammeter

31. Glycolysis occurs in the cell's_____
(A) Nucleus (B) Cytoplasm (C) Ribosome (D) Lysosome

32. When biking, aerodynamic resistance consist of two forces:
(A) Air pressure and friction (B) Friction and gravity
(C) Air pressure and strength (D) Drag and lift

33. Which is typically the slowest swimming stroke?
(A) Breaststroke (B) Freestyle (C) Backstroke (D) Butterfly

34. The permanent headquarter of IOC is located in
(A) Atlanta (B) Beijing (C) Lausanne (D) Stockholm

35. Sliding Filament theory of muscle contraction was given by
(A) Newton (B) Huxley (C) Darwin (D) Kelvin

36. Kinaesthetic knowledge is an important aspect of
(A) Personal feedback (B) Teacher assisted feedback
(C) Feedback received through tape recorder (D) External feedback

37. Vitamin C is also known as
(A) Ascorbic acid (B) Pyridoxine (C) Pantothenic acid (D) Niacin

38. What is the scale applied in statistics, which imparts a difference of magnitude and proportions, is considered as?

(A) Ratio scale (B) Satisfactory scale

(C) Exponential scale (D) Goodness scale

39. Bass stick test is used for measuring

(A) Strength (B) Balance (C) Agility (D) Coordination

40. Which is a hypokinetic disease?

(A) Typhoid (B) Dengue (C) Malaria (D) Diabetes

41. The most direct method of measuring body composition is:

(A) Under water weighing (B) Skin fold test

(C) Body mass index (D) Weight

42. The Law of acceleration is also known as:

(A) Law of momentum (B) Law of inertia

(C) Law of action and reaction (D) Boyle's law

43. Tripsin helps in the digest of :

(A) Vitamins (B) Fats (C) Carbohydrates (D) Protein

44. A test is considered to be reliable if it has

(A) Comparability (B) Commonality (C) Consistency (D) Continuity

45. Increase in muscle mass due to heavy weight training is called:

(A) Muscular Hypotrophy (B) Muscular Atrophy

(C) Muscular Hypertrophy (D) Haematoma

46. Which form of reasoning is the process of drawing a specific conclusion from a set of premises?

(A) Rationalism (B) Deductive reasoning

(C) Inductive reasoning (D) Probabilistic

47. In the human body, the hormone which is secreted into the blood and which controls the rate of the heart beat is?

(A) Insulin (B) Testosterone (C) Thyroxine (D) Adrenaline

48. Flying Sikh, Milkha Singh received which honour from the Government of India in the year 1959?

(A) Padma Shri (B) Padma Bhushan (C) Padma Vibhushan (D) Bharat Ratna

49. The scope in research is indicated by

(A) Interpretation of research results (B) Limitations of the study

(C) Definition and explanation of terms (D) Delimitations of the study

50. Normal Probability Curve should be

(A) Zero skewed (B) Positively skewed

(C) Negatively skewed (D) Leptokurtic skewed

x-x-x

ROUGH WORK

Electrical Engineering(Ph.D.)

1. The principle according to which an experiment should be repeated more than once for accuracy is

(A) Principle of local control
(B) Principle of randomization
(C) Principle of replication
(D) Principle of multiplication

2. Sampling errors can be reduced by

(A) Proper division of sampling units
(B) Proper measuring device
(C) Increasing sample size
(D) Proper sampling frame

3. Which type of sampling techniques lead to over or under representation of the population

(A) Restricted sampling
(B) Unrestricted sampling
(C) Systematic sampling
(D) Stratified random sampling

4. The approach of the scale development according to which correlation between different items is established on the basis of a common factor is

(A) Item analysis approach
(B) Factor analysis approach
(C) Cumulative scale approach
(D) Consensus approach

5. In which method enumerators are used?

(A) Observation method
(B) Interview method
(C) Questionnaire method
(D) Schedule method

6. Partial correlation provides information about the

(A) Mean value
(B) Peakedness of the curve
(C) Scattering of values around mean
(D) Association between one independent and one dependent variable, keeping other variables constant

7. The variance of the height for the class of 5 students in a school is 0.31 feet. The sample of 10 students from this class is taken to check whether the variance of the height of 15 students is same as the variance of the whole class or not. Check this at 5% level of significance. The height of 15 students is as follows:

(4.5, 4, 4.5, 4.5, 4, 4.2, 4.3, 4.5, 4.5, 4.8, 5, 5.1, 4.9, 5)

(A) The variance of population and that of sample height of students of class 5 are same

(B) The variance of population and that of sample height of students of class 5 are not same

(C) The results cannot be determined

(D) The results can be determined with 1% significance level

8. If Null hypothesis $SH_0 : \mu = 90$ and the alternative hypothesis is $H_1 : 4 < 90$, it is appropriate to use a

(A) Two-tailed test

(B) Right tailed test

(C) Left tailed test

(D) Chi-Square test

9. The incidence of occupational disease in an industry in such that the workmen have 20% chance of suffering from it. What is the probability that out of 6 workmen 4 or more will contact disease?

(A) 160/3

(B) 39/169

(C) 53/3125

(D) 3/69

10. Suppose in key punching of 80 column IBM cards, the mean number of mistakes per card is 0.3. What per cent of cards will have no mistake?

(A) 74%

(B) 12%

(C) 30%

(D) 120%

11. Eight coins are tossed together and the occurrence of a head is termed as a success. Write down the Binomial Distribution of probabilities for the occurrence of 0, 1, 2,…., 8 heads. What is the arithmetic mean and variance of the distribution?

(A) 2

(B) 9

(C) 3

(D) 5

12. The data on which all the numerical operations can be performed is

(A) Nominal data

(B) Ordinal data

(C) Ratio data
(D) Interval data

13. If the difference between the standard deviation and variance of a data is 12 then find the sum of the variance and standard deviation of that data
(A) 20
(B) 15
(C) 18
(D) 22

14. If the mean and standard deviation of 75 observations is 40 and 8 respectively, find the new mean and standard deviation if (i) Each observation is multiplied by 5. (ii) 7 is added to each observation.
(A) 40 and 8
(B) 40 and 7
(C) 41 and 8
(D) 41 and 7

15. For a moderately skewed distribution, the mean and median are respectively 26.8 and 27.9. What is the mode of the distribution?
(A) 31.1
(B) 30.1
(C) 30
(D) 31

16. Which of the following is not included in a research proposal?
(A) Purpose
(B) Population
(C) Research design
(D) Organizational profit

17. _____ is also called false positive.
(A) Type I error
(B) Type II error
(C) Type III error
(D) Type IV error

18. Find the coefficient of correlation between them from the following two regression equations:

$$4X-5Y+33 = 0$$
$$20X-9Y-107 = 0$$

(A) 0.06
(B) 0.08

(C) 0.8
(D) 0.6

19. For 5 pairs of observations the following results are obtained $\sum X=15$, $\sum Y=25$, $\sum X2=55$, $\sum Y2=135$, $\sum XY=83$. Estimate the value of X on the first line when $Y=12$ and value of Y on the second line if $X=8$.
(A) 9
(B) 10
(C) 8
(D) 7

20. A man travels from Jaipur to Agra by a car and takes 4 hours to cover the whole distance. In the first hour he travels at a speed of 50 km/hr, in the second hour his speed is 64 km/hr, in third hour his speed is 80 km/hr and in the fourth hour he travels at the speed of 55 km/hr. Find the average speed of the motorist.
(A) 61.5
(B) 60.5
(C) 65.1
(D) 6.1

21. Which statements are true for harmonic mean?
I – It is rigidly defined
II – It is based on all the observations of the series
III – It is suitable in case of series having wide dispersion
IV – It is the reciprocal of the arithmetic mean of reciprocals of the observations
(A) Only I and II
(B) I, II, III
(C) All statements are true
(D) All statements are not true

22. Which of the following test is used when population is normal and finite, sample size is small and population variance is unknown?
(A) T test
(B) F test
(C) Z test
(D) Chi – Square Test

23. The one-sample z statistic is used instead of the one-sample t statistic when _____.
(A) μ is known
(B) μ is unknown
(C) σ is known
(D) σ is unknown

24. A random sample of 20 observations produced a sample mean of $xx\bar{}$=92.4 and s=25.8. What is the value of the standard error of $x\bar{}$?

(A) 4.6
(B) 15.9
(C) 1.3
(D) 5.8

25. Confidence intervals are useful when trying to estimate _____.
(A) unknown parameters
(B) known parameters
(C) unknown statistics
(D) known statistics

26. A power system network with a capacity of 100 MVA has a source impedance of 10 % at a point. The fault level at that point is
(A) 10 MVA
(B) 30 MVA
(C) 3000 MVA
(D) 1000 MVA

27. The voltages across the various discs of a string of suspension insulators having identical discs is different due to
(A) Surface leakage currents
(B) Series capacitance
(C) Shunt capacitance to ground
(D) Series and shunt capacitances

28. In a power system with negligible resistance, the fault current at a point is 8.00 pu. The series reactance to be included at the fault point to limit the short-circuit current to 5.00 pu is
(A) 3.000 pu
(B) 0.200 pu
(C) 0.125 pu
(D) 0.075 pu

29. Rated breaking capacity (MVA) of a circuit-breaker is equal to
(A) The product of rated breaking current (kA) and rated voltage(kV)
(B) The product of rated symmetrical breaking current (kA) and rated voltage(kV)
(C) The product of breaking current (kA) and fault voltage(kV)
(D) Twice the value of rated current (kA) and rated voltage(kV)

30. If, in a short transmission line, resistance and inductive reactance are found to be equal and regulation appears to be zero, then the load will
(A) have unity power factor
(B) have zero power factor
(C) be 0.707 leading

(D) be 0.707 lagging

31. A pulse transformer is used in a driver circuit
(A) To prevent *dc* triggering
(B) To shape the trigger signal
(C) To generate high-frequency pulses
(D) To provide isolation

32. McMurray commutation is superior to parallel commutation in respect of
(A) Number of components
(B) Overload spike at the output
(C) Instantaneous reduction in SCR current
(D) Trigger circuit

33. A purely inductive load is controlled by a single-phase ac voltage controller using back to back connected SCRs. If the firing angle of each thyristor is 75^o, the current through two SCRs will flow for
(A) 180^o and 180^o
(B) 160^o and 160^o
(C) 100^o and 100^o
(D) 160^o and 0^o

34. A step-up chopper is fed from a 220 V dc source to deliver a load voltage of 660 V. If the non-conduction time of the thyristor is 100 microseconds, the required pulse width would be
(A) 100 microseconds
(B) 200 microseconds
(C) 220 microseconds
(D) 660 microseconds

35. A series circuit consists of R=2.4 ohms, L=25 micro Henry and a thyristor. For obtaining self-commutation in the circuit, the value of C should be equal to
(A) 50 microfarads
(B) 30 microfarads
(C) 20 microfarads
(D) 10 microfarads

36. In a single-phase semi-converter for continuous conduction, each SCR conducts for
(A) α
(B) π
(C) $\alpha+\pi$
(D) $\pi-\alpha$

37. Transformers operating in parallel will share a common load in the best possible manner if
(A) The leakage impedances are proportional to their respective kVA ratings
(B) The leakage impedances are equal
(C) Per unit leakage impedances are equal
(D) Per unit leakage impedances are proportional to their respective kVA ratings

38. A 4-pole dc generator runs at 1500 rpm. The frequency of current in the armature winding is
(A) 25 Hz
(B) 50 Hz
(C) zero Hz
(D) 100 Hz

39. A synchronous motor fed from infinite bus, is delivering half of full-load. If an increase in field current causes an increase in the armature current, then the motor will
(A) Deliver reactive and active power to the bus
(B) Absorb reactive power and active power from the bus
(C) Absorb reactive power from the bus and deliver active power to the bus
(D) Deliver reactive power to the bus and absorb active power from the bus

40. Induction generator deliver power at
(A) Unity power factor
(B) Zero power factor lagging
(C) leading power factor
(D) lagging power factor

41. The instantaneous value of currents in both phases 'b' and 'c' of a 3-phase balanced system are -10 A. For a phase sequence value of currents in phase 'a' is
(A) 17.32 A
(B) 10 A
(C) 20 A
(D) 34.64 A

42. Which of the following is an open loop control system?
(A) Ward Leonard control
(B) Metadyne
(C) Stroboscope
(D) Field controlled DC machine

43. In a control system the output of the controller is given to
(A) Amplifier
(B) Sensor
(C) Final control element

(D) Comparator

44. In a temperature control system, what conversion in signal takes place?
(A) Error to digital
(B) Error to analog
(C) Digital to analog
(D) Analog to digital

45. Which of the following element is not used in an automatic control system?
(A) Final control element
(B) Sensor
(C) Oscillator
(D) Error detector

46. In closed loop control system, what is the sensitivity of the gain of the overall system, M to the variation in G?
(A) G/1+H
(B) G/1+GH
(C) G/1+G
(D) 1/1+GH

47. A 200 microhenry coil has Q of 250 at resonance frequency of 250 kHz. The effective resistance of the coil is
(A) 8 ohms
(B) 4 ohms
(C) 2 ohms
(D) 1 ohms

48. In a pure inductive circuit if the supply frequency is reduced to half, the current will be
(A) Reduced to one fourth
(B) Reduced by half
(C) Doubled
(D) Four times

49. The transfer function of a system is 10/(1+s). When operated at a unity feedback system, the steady-state error to a unit step input will be
(A) zero
(B) 1/11
(C) 10
(D) infinity

50. While forming Rouths array, the situation of a row of zeros indicates that the system

(A) Has symmetrically located roots

(B) Is not sensitive to variations in gain

(C) Is stable

(D) Unstable

x-x-x

ROUGH WORK

Biotechnology Engineering(Ph.D.)

1. Data collection and passing through one statistical method, organisation, classification, tabulation, computation, etc. are called
(A) Raw Data
(B) Processed Data
(C) Unorganised Data
(D) Personal Data

2. While planning the research is, you have to prepare
(A) Null Hypothesis
(B) Working Hypothesis
(C) Relational Hypothesis
(D) Descriptive Hypothesis

3. Question that can be converted into a problem is called
(A) Solution
(B) Examination
(C) Problem formulation
(D) Problem Solving

4. _____is the first step of Research process.
(A) Formulation of a problem
(B) Collection of Data
(C) Editing and Coding
(D) Selection of a problem

5. Research that follows the case study method is called
(A) Clinical or diagnostic
(B) Causal
(C) Analytical
(D) Qualitative

6. Data which uses humans in studies are called
(A) Territorial data
(B) Organizational data
(C) Peripheral data
(D) Demographic data

7. A Blue print of Research work is called
(A) Research problem
(B) Research design
(C) Research tools
(D) Research methods

8. If you do not acknowledge the borrowed material in your study is called
(A) Acknowledgement
(B) Foot note
(C) Index
(D) Plagiarism

9. Survey is a _____ Study.
(A) Descriptive
(B) Fact finding
(C) Analytical
(D) Systematic

10. NMR spectroscopy is a technique that exploits the magnetic properties of
(A) electrons
(B) nuclei
(C) positrons
(D) photons

11. Beer-Lambert Law states that
(A) absorbance is proportional to both the path length and concentration of the absorbing substance
(B) absorbance is proportional to the log of the concentration of the absorbing substance
(C) absorbance is proportional only to the concentration of the absorbing substance
(D) absorbance is proportional only to the path length of the absorbing substance

12. Which of the enzyme is non-proteinaceous in nature
(A) Urease
(B) Peptidase
(C) Ribozyme
(D) Phosphatase

13. Which of the following microscopic techniques uses electrons reflected from the surface of a specimen to create image
(A) Phase-contrast Microscope
(B) Transmission Electron Microscope
(C) Scanning Electron Microscope
(D) Light Microscope

14. GENSCAN, and CONTRAST are *ab initio* methods for
(A) Phylogenetic analysis
(B) Multiple Sequence Alignment
(C) Gene prediction
(D) Primer designing

15. Who discovered the recombinant DNA technology
(A) HG Khorana
(B) JD Watson
(C) Sutton and Boveri
(D) Stanley Cohen and Herbert Boyer

16. Inserting a gene encoding a pathogenic microbe's surface protein into a harmless virus produces a
(A) piggyback vaccine

(B) virulent virus
(C) active disease-causing pathogen
(D) pharmaceutical human protein

17. Restriction endonucleases:
(A) Are synthesized by bacteria as part of their defense mechanism
(B) Are used for in vitro DNA synthesis
(C) Are used in genetic engineering for ligation of two DNA molecules
(D) Are present in mammalian cells for degradation of DNA when the cell dies

18. In 3° structure of proteins, folding and shaping is done by
(A) hydrophobic interactions
(B) polar interactions
(C) hydrogen bonding
(D) base pairing

19. Ratio between different segregation types arising after sporulation is measure of
(A) tetratype
(B) linkage
(C) recombination
(D) replication

20. In deamination, amino acid is converted in to
(A) aldol acid
(B) keto acid
(C) hydrochloric acid
(D) carboxylic acid

21. Differentiation potential of stem cells specifies
(A) stochastic differentiation
(B) asymmetric replication
(C) potency
(D) self renewal

22. Tendency of alleles that are located close together on chromosome to be inherited together during meiosis is
(A) genetic linkage
(B) genetic code
(C) inheritance
(D) gene expression

23. A process by which a protein structure assumes it's functional shape or conformation is
(A) denaturing
(B) folding

(C) synthesis
(D) hydrolysis

24. Tunnels which allow specific ions to pass through them are called
(A) selectively permeable tunnels
(B) permeable tunnels
(C) both A and B
(D) channel proteins

25. Pairing between two nucleotides in RNA that does not follow Watson-Crick base pair rules is called
(A) Degeneracy
(B) Base pairing
(C) Lagervist pairing
(D) Wobble pairing

26. Enzyme that makes ATP by chemiosmosis is
(A) ATP dehydrogenase
(B) Gyraze
(C) ATP synthase
(D) Dehydrogenase

27. Enzymes that catalyse strand transfer step during recombination are called
(A) recombinases
(B) transferases
(C) helicase
(D) gyraze

28. In both meiotic and mitotic cells, recombination between homologous chromosomes is a common mechanism used in
(A) DNA replication
(B) Transcription
(C) DNA repair
(D) Translation

29. A steroid which decreases membrane fluidity is
(A) cholesterol
(B) cholic acid
(C) estradiol
(D) progesterone

30. Euchromatin is
(A) lightly packed form of chromatin
(B) tightly packed form of chromatin
(C) concentrated form of chromatin
(D) elongated form of chromatin

31. Alignment method suitable for aligning closely related sequences is
(A) multiple sequence alignment
(B) pairwise alignment
(C) global alignment
(D) local alignment

32. The computational method that tries to find the best matching between two molecule, a receptor and ligand is called
(A) Molecular matching
(B) Molecular docking
(C) Molecular fitting
(D) Molecular affinity checking

33. The process of finding relative location of genes on a chromosome is called
(A) gene tracing
(B) genome mapping
(C) genome walking
(D) chromosome walking

34. A compound that has desirable properties to become a drug is called
(A) lead
(B) find
(C) fit drug
(D) fit compound

35. In gas chromatography, the basis for separation of the components of the volatile material is the difference in
(A) partition coefficients
(B) conductivity
(C) molecular weight
(D) molarity

36. Ion exchange chromatography is based on the
(A) electrostatic attractions
(B) electrical mobility of ionic species
(C) adsorption chromatography
(D) partition chromatography

37. The speed of migration of ions in an electric field depends on
(A) magnitude of charge and mass of molecule
(B) magnitude of charge and shape of molecule
(C) shape and size of the molecule
(D) magnitude of charge, shape and mass of molecule

38. What is the role of SDS in SDS-PAGE
(A) protein denaturing and imparting net negative charge

(B) imparting overall negative charge to the protein
(C) imparting equal mass to proteins
(D) protein unfolding and imparting net positive charge

39. Which of the following statements about Western Blotting is correct?
(A) The detection of a particular protein by Western Blotting relies on the very specific interaction between the protein and its antibody
(B) The detection of a particular protein by Western Blotting relies on labelling the protein with a specific dye
(C) The detection of a particular protein by Western Blotting relies on labelling the antibody with a specific dye
(D) The detection of a particular protein by Western Blotting relies on the denaturation of the protein

40. The process that produces a new individual with a known genetic makeup is called _____.
(A) regenerative medicine
(B) induced pluripotent stem cells
(C) therapeutic cloning
(D) reproductive cloning

41. Nobel prize in medicine to Tu Youyou was given for his discovery of
(A) RNAi
(B) Autophagy
(C) Artimisinin
(D) Stem cells from skin

42. Mechanisms for autophagy was discovered by
(A) Tu Youyou
(B) Yoshinori Ohsumi
(C) Kornberg
(D) Bob Dylan

43. Which of the following viral vectors are most often used in clinical gene therapy trials?
(A) Lentiviral vectors
(B) Vaccinia vectors
(C) Adeno-associated viral vectors
(D) Adenoviral vectors

44. Chromatin consists of:
(A) Histones only.
(B) DNA and histones only.
(C) Histones and other proteins only.
(D) DNA, histones, and other proteins.

45. HIV attacks:
(A) T helper cells
(B) T cytotoxic cells
(C) B cells
(D) Macrophages

46. The two most common processes that lead to production of multiple functional proteins from the same DNA sequence are
(A) RNA editing and alternative splicing
(B) Protein folding and posttranslational covalent modifications
(C) Alternative splicing and posttranslational covalent modifications
(D) Posttranslational covalent modification and transcriptional regulation

47. The Haber-Bosch process is important in the:
(A) Reduction of soil erosion.
(B) Development of pesticides.
(C) Manufacture of fertilizers.
(D) Development of efficient irrigation systems.

48. The inability to distinguish between self and non-self cells may lead to :
(A) Hypersensitivity
(B) Auto-immune diseases
(C) Immunodeficiency
(D) Tolerance

49. _____ is the principal source of nitrogen available to crop plants.
(A) Organic nitrogen
(B) Nitrate
(C) Ammonium
(D) Glutamine

50. The Hybridomas are produced by
(A) Fusing T cells with myeloma cells
(B) Fusing T helper cells with myeloma cells
(C) Fusing B cells with myeloma cells
(D) Fusing WBC with RBC

x-x-x

Chemical Engineering(Ph.D)

1. SPSS is an acronym of the following?
(A) Statistical Predictions for Social Sciences.
(B) Sexual Preferences for the Sixties and Seventies.
(C) Statistical Package for the Social Sciences.
(D) Sexual Performance and SAD Syndrome.

2. Random sampling is also called _____.
(A) Availability sampling (B) Probation sampling C
(C) Probability sampling (D) Prospect sampling

3. What is a sampling unit?
(A) The population.
(B) The basic unit containing the elements of the population to be sampled.
(C) All the individual elements of the final sample, drawn together.
(D) The method used to collect the sample.

4. Action research means _____.
(A) A longitudinal research
(B) An applied research
(C) A research initiated to solve an immediate problem
(D) A research with socioeconomic objective

5. What are the conditions in which Type-I error occurs?
(A) The null hypotheses get accepted even if it is false
(B) The null hypotheses get rejected even if it is true
(C) Both the null hypotheses as well as alternative hypotheses are rejected
(D) Both the null as well as alternative hypotheses are accepted

6. Which of the following is a final stage of a research?
(A) Preparation of the report (B) Analysis of Data
(C) Hypothesis Testing (D) Generalization and Interpretation

7. Which of the following type of research mainly focusing the relationships between variables without controlling or manipulating any of them?
(A) Longitudinal survey (B) Pooled surveys
(C) Correlational survey (D) Cross-sectional survey

8. Which of the following is not a characteristics of longitudinal survey?
(A) Collecting data from same subjects over a period of time
(B) Observe variables repeatedly
(C) Analysing changes at both individual and group level
(D) Get a "snapshot" or picture of a group

9. Ogives is also known as?
(A) Cumulative frequency curves (B) Frequency distributions
(C) Transcendental Curve (D) Proportional distribution

10. Which of the following is not a data-collection method?

(A) Research questions (B) Unstructured interviewing

(C) Postal survey questionnaires (D) Participant observation

11. All cause non sampling errors except

(A) Faulty tools of measurement (B) Defect in data collection

(C) Non response (D) Inadequate sample

12. _____ is referred to as "the father of research on teaching"?

(A) N. L. Gage (B) David Berliner (C) Egon Brunswik (D) Donald T. Campbell

13. Uniting various qualitative methods with quantitative methods can be called as.....

(A) Coalesce (B) Triangulation (C) Bipartite (D) Impassive

14. These are the examples of secondary data –

(A) Statistical survey, respondents' answers, judgement of the researcher

(B) Telephone survey, mail survey, opinion polls

(C) Statistical survey reports, Government publications, trade journals

(D) Interviews of respondents, questionnaires, direct collection of data in lab

15. Which of the following is the most efficient random sampling technique?

(A) Simple random sampling (B) Proportional stratified sampling

(C) Cluster random sampling (D) Systematic sampling

16. In ANOVA, V stands for -

(A) Variable (B) Vision (C) Visual (D) Variance

17. Type II error occurs when -

(A) H_0 is false and is rejected (B) H_0 is false and is accepted

(C) H_1 is true and rejected (D) H_1 is true and accepted

18. How often does the Census Bureau take a complete population count?

(A) Every year (B) Every five years (C) Every ten years (D) Twice a year

19. A number calculated with complete population data and quantifies a characteristic of the population is called which of the following?

(A) A datum (B) A statistic (C) A parameter (D) A population

20. What is a research design?

(A) The way data is collected in a research study

(B) The way data is analyzed in a research study

(C) The way the research question is formulated

(D) The overall plan for a research study

21. The degree of freedom for paired t-test based on n pairs of observations is:
(A) 2n - 1 (B) n - 2 (C) 2(n - 1) (D) n – 1

22. Qualitative research is associated with
(A) Emphasis on greater sample size
(B) A structured, rigid methodology
(C) Unstructured, flexible and open methodology
(D) Measurement of variables

23. A research design serves two functions: a) specifying methods and procedures that will be applied during the research process and b) a justification for these methods and procedures. The second function is also called control of _____.
(A) Variables (B) Variance (C) Study design (D) Research design

24. A list of questions which is handed over to the respondent, who reads the questions and records the answers himself is known as the:
(A) Interview schedule (B) Questionnaire
(C) Interview guide (D) None of these

25. Questions in which only two alternatives are possible is called
(A) Multiple choice questions (B) Dichotomous questions
(C) Open ended questions (D) Structured questions

26. A plot of lnk vs. 1/T, where k is the rate constant is known as
(A) Bode diagram (B) Van't Hoff plot
(C) Arrhenius plot (D) Heat flow diagram

27. Which of these columns incurs the lowest pressure drop?
(A) Packed column (with stacked packing) (B) Bubble plate column
(C) Packed column (with dumped packing) (D) Pulse column

28. Hydrotreating is a process used for
(A) removal of water from crude oil
(B) treatment of crude oil with water
(C) improving octane number of gasoline
(D) removal of sulphur and nitrogen from petroleum fractions

29. The local velocity of a fluid along a streamline can be measured by
(A) Pitot tube (B) Venturi meter (C) Rotameter (D) Orifice meter

30. In the Mc-Cabe-Thiele diagram, if the x-coordinate of the point of intersection of the q-line and the VLE curve is greater than the x-coordinate of the feed point, then the quality of the feed is
(A) Superheated vapour (B) Liquid below bubble point
(C) Saturated vapour (D) Saturated liquid

31. The Grashof number is defined as the ratio of

(A) Buoyancy to inertial forces (B) Buoyancy to viscous forces

(C) Inertial to viscous forces (D) Buoyancy to surface tension forces

32. Nitrous oxide reacts with oxygen to form nitrogen dioxide in a reversible reaction given below. Calculate the equilibrium constant at 25°C for the reaction

$$2NO(g) + O_2(g) \rightleftharpoons 2\ NO_2(g), \text{ given that } \Delta_r G° = -81.2 \text{ kJ mol}^{-1}.$$

(A) 5.91×10^{-13} (B) 28.2 (C) 1.03 (D) 1.71×10^{14}

33. Amino acids react to form peptides and proteins, this process is known as

(A) addition polymerization (B) substitution polymerization

(C) condensation polymerization (D) hydration polymerisation

34. A distillation column at a pilot plant is scaled up by 3 times for industrial use at steady state. After scaling up

(A) The number of theoretical trays increased by 3 times

(B) The minimum reflux ratio is increased by 3 times

(C) The feed flow rate and product flow rate is increased by 3 times

(D) The feed composition and product composition is increased by 3 times

35. An ideal plug flow reactor should have the following characteristics

(A) no back mixing of the reactants and products

(B) complete back mixing of the reactants and products

(C) uniform temperature, pressure and composition across any section normal to the fluid motion

(D) uniform temperature, pressure and composition at any location in the longitudinal direction

36. In Biot number, the characteristic length used is the ratio of the _____ of the solid.

(A) perimeter to surface area (B) surface area to volume

(C) volume to surface area (D) surface area to perimeter

37. Air initially at 101.3 kPa and 40°C and with a relative humidity of 50%, is cooled at constant pressure to 30°C. The cooled air has a

(A) higher dew point (B) higher absolute (specific) humidity

(C) higher relative humidity (D) higher wet bulb temperature

38. Zeolite ZSM-5 is added to commercial FCC catalyst for

(A) promoting SO_2 reduction

(B) promoting CO oxidation

(C) improving tolerance to metal content in feed

(D) enhancing octane number

39. For an ideal black body,
(A) absorptivity = 1 (B) reflectivity = 1 (C) emissivity = zero (D) transmissibility = 1

40. The chief raw material for the commercial production for methanol is
(A) Synthesis gas (B) Formaldehyde (C) Acetic acid (D) Ethanol

41. If the baffle spacing in a shell and tube heat exchanger increases, then the Reynolds number of the shell side fluid
(A) remains unchanged
(B) increases
(C) increases or decreases depending on number of shells passes
(D) decreases

42. Steel is heated at about 875°C where the structure consists of entirely austenite. It is then cooled suddenly at a temperature of about 250°C to 525°C. This process of heat treatment is known as
(A) Martempering (B) Normalising (C) Austempering (D) Annealing

43. A flow is called sub-sonic, if the Mach number is
(A) less than unity (B) between 1 and 6
(C) unity (D) more than 6

44. Two pipes of same nominal diameter but different schedule numbers will have
(A) The same inside diameter (B) The same outside diameter
(C) The same wall thickness (D) None of these

45. The proportional controller with gain Kc is used to control first order process. The offset will increase if
(A) Kc is reduced (B) Kc is increased
(C) Integral control action is introduced (D) Derivative control action is introduced

46. Simultaneous heat and mass transfer are occurring in a fluid flowing over a flat plate. The flow is laminar. The concentration boundary layer will coincide with the thermal boundary layer, when
(A) Sc = Nu (B) Sh = Nu (C) Sh = Pr (D) Sc = Pr

47. Saturated vapor is condensed to saturated liquid in a condenser. The heat capacity ratio is $C_r = \frac{C_{min}}{C_{max}}$. The effectiveness (ε) of the condenser is
(A) $\frac{1-\exp[-NTU(1+C_r)]}{(1+C_r)}$ (B) $\frac{1-\exp[-NTU(1-C_r)]}{1-C_r\exp[-NTU(1-C_r)]}$
(C) $\frac{NTU}{1+NTU}$ (D) $1-\exp(-NTU)$

48. If $x^2 + x - 1 = 0$, what is the value of $x^4 + \frac{1}{x^4}$?

(A) 1 (B) 5 (C) 7 (D) 9

49. Antioxidants are added to rubber to protect it from the attack of light, heat & atmospheric ozone. Which of the following is an antioxidant used in rubber?

(A) Carbon (B) Alkylated diphenyl amine

(C) Thiokol (D) Magnesium

50. Tetra fluoro ethylene is the monomer of

(A) Nylon66 (B) Neoprene (C) Teflon (D) PVC

x-x-x

ROUGH WORK

Civil Engineering(Ph.D.)

1. Research is an organized and systematic enquiry" Defined by
(A) Marshall (B) P.V. Young (C) Emory (D) Kerlinger

2. Research is a "Scientific undertaking" opined by
(A) Young (B) Kerlinger (C) Kothari (D) Emory

3. A systematic step-by-step Procedure following logical process of reasoning" called
(A) Experiment (B) Observation (C) Deduction (D)Scientific method

4. The research studies that explore the effect of one thing on another and more specifically, the effect of one variable on another are known as
(A) Causal research (B) Applied research
(C) Conclusive research (D) Exploratory research

5. If the researcher is concerned with finding out who, what, when or how much, then the study is _____
(A) Descriptive research (B) Exploratory research
(C) Empirical research (D) Causal research

6. Sample size depends on
(A) Type of problem investigated (B) Resources available
(C) Required precision (D) All of these

7. Data obtained by the investigator from personal experimental studies is called
(A) Primary data (B) Arrayed data (C) chronological data (D) None of these

8. Which of the following is a measure of variation?
(A) standard deviation (B) midrange (C) mode (D) median

9. The ratio between experimental and observed results is represented by
(A) theta value (B) chi- square (C) variance ratio (D) correlation

10. A regression line is a straight line which
(A) is located as close as possible to all the points of a scatter chart
(B) is defined by an equation having 2 parameters: the slope and the intercept
(C) provides an approximate relationship between the values of two parameters
(D) is parallel to one of the coordinate axes

11. Ethical Neutrality is a feature of _____
(A) Deduction (B) Scientific method (C) Observation (D) Experience

12. The Student's t test is
(A) a parametric test (B) a nonparametric test
(C) a test for comparing averages (D) a test for comparing variances

13. What is the alternative name for a repeated measures t- test?
(A) unrelated t-test (B) related t-test
(C) a paired samples t-test (D) unpaired sample t-test

14. SPSS stands for

(A) simple perfect squared square (B) statistical product and service solutions

(C) statistical package for social science (D) software package for statistical science

15. A set of all possible data values for a subject under consideration is called

(A) descriptive statistics (B) a sample

(C) a population (D) statistics

16. Preliminary data collection is a part of the_____

(A) Descriptive research (B) Exploratory research

(C) Applied research (D) Explanatory research

17. The main purpose of research in education is to _____

(A) Help in the personal growth of an individual

(B) Help the candidate become an eminent educationist

(C) Increase job prospects of an individual

(D) Increase social status of an individual

18. The method by which a sample is chosen

(A) Unit (B) Design (C) Random (D) Census

19. Research is classified on the basis of_____ and methods

(A) Purpose (B) Intent (C) Methodology (D) Techniques

20. Scientific method is committed to _____

(A) Objectivity (B) Ethics (C) Proposition (D) Neutrality

21. A system of systematically interrelated concepts definitions and propositions that are advanced to explain and predict phenomena _____ is

(A) Facts (B) Values (C) Theory (D) Generalization

22. Research and Development become the index of development of the country. Which of the following reasons are true with regards to this statement?

(A) R&D targets human development

(B) R&D can enhance people's standard of living in the country

(C) R&D reflects the actual economic and social conditions being prevailed in the country

(D) All the above

23. Which of the following does not correspond to characteristics of research?

(A) Research is not passive (B) Research is systematic

(C) Research is not a problem-oriented (D) Research is not a process

24. A researcher is interested in studying the prospects of a particular political party in an urban area. So, what tool should he prefer for the study?

(A) Rating Scale (B) Interview (C) Questionnaire (D) Schedule

25. What does a good thesis involve?

a) Reducing punctuations as well as grammatical errors to minimalist

b) Correct reference citations

c) Consistency in the way of thesis writing
d) Well defined abstract

Select the answers from the codes given below:

(A) b, c and d
(B) a, b, c and d
(C) a, b and c
(D) a, b and d

26. A punch of 20 mm diameter is used to punch a hole in 8mm thick plate. If the force 14. required to create a hole is 110 kN, the average shear stress in the plate will be nearly
(A) 410 MPa (B) 320 Mpa (C) 220 MPa (D) 140 Mpa

27. As per 49. IS-456: 2000, cracking of concrete in tension zone cannot be avoided but can be limited by
1. Adhering to the codal requirements of minimum steel area
2. Proper and prolonged curing of concrete
3. Increasing water cement ratio to increase workability

(A) 1 and 2 only (B) 1 and 3 only (C) 2 and 3 only (D) 1, 2 and 3

28. A pitot tube is used to measure
(A) pressure (B) difference in pressure
(C) velocity of flow (D) none of these

29. Which one of the following gases is colourless with strong odour, irritates mucous membranes at common levels, can cause cough, fatigue and interference with lung functions at higher concentration?
(A) Carbon monoxide (B) Hydrogen (C) Ozone (D) Nitrogen

30. Which one of the following cements is a deliquescent?
(A) Quick setting Portland cement (B) White and Coloured cement
(C) Calcium Chloride cement (D) Water Repellent cement

31. Consider the following data for concrete with mild exposure
Water-cement ratio = 0.50 Water = 191.6 litre
The required cement content will be
(A) 561 kg/m^3 (B) 472 kg/m^3 (C) 383 kg/m^3 (D) 294 kg/m^3

32. A steel bar 2m long, 20mm wide and 15mm thick is subjected to a tensile load of 30kN. If Poisson's ratio is 0.25 and young's modulus is 200 GPa, an increase in volume will be
(A) 160 mm^3 (B) 150 mm^3 (C) 140 mm^3 (D) 130 mm^3

33. Which one of the following techniques is not covered in Project Network Analysis?
(A) Critical Path Method (B) Program Evaluation and Review Techniques
(C) Procedure Network Analysis (D) Measurement Book

34. In PERT technique, the time estimate of activities and probability of their occurrence follow

(A) Binomial distribution (B) Normal distribution
(C) Poisson distribution (D) β-distribution

35. Which one of the following statement is correct regarding centrifugal pumps?
(A) The discharge is fluctuating and pulsating
(B) It is used for large discharge through smaller heads
(C) The efficiency is low
(D) It runs at low speed

36. A turbine develops 7225 kW power under a head of 25 m at 135 rpm. The specific speed of the turbine will be nearly
(A) 245 rpm (B) 225 rpm (C) 205 rpm (D) 185 rpm

37. In solid waste management, waste utilization is achieved by
(A) Reduce, Reuse and Recycle (B) Reuse, Reclamation and Recycling
(C) Recover, Recycling and Reproduce (D) Reuse, Reproduce and Recycling

38. How many types of levelling are there?
(A) 2 (B) 3 (C) 4 (D) 5

39. Triaxial compression test is used to find _____ of soil.
(A) Compressive strength (B) Permeability
(C) Specific gravity (D) Shear strength

40. Indian roads are classified into_____ based on location
(A) 6 (B) 3 (C) 4 (D) 5

41. Running Speed of vehicle is equal to_____
(A) Travel speed + delay (B) Travel speed
(C) Travel speed - delay (D) Average travel speed and delay

42. Peak hour factor is expressed in percentage of_____
(A) ADT (B) AADT (C) PCU (D) DF

43. In the case of dam spillways, the approaching Froude number usually lies in the range of_____
(A) < 2.5 m (B) > 9.0 m (C) 2.5 to 4.5 m (D) 4.5 to 9.0 m

44. River intakes is usually situated on_____
(A) the concave side of the curve (B) the convex side of the curve
(C) straight reach (D) the downstream of a sewer outfall

45. The ratio of the horizontal stress to the vertical stress is called coefficient of
(A) Active earth pressure (B) Passive earth pressure
(C) Earth pressure (D) Plastic earth pressure

46. A coarse-grained soil has a void ratio of 0.78 and specific gravity as 2.67. The critical gradient at which a quick sand condition occurs will be
(A) 0.62 (B) 0.74 (C) 0.82 (D) 0.94

47. Electrostatic precipitators are used for removal of
1. Gaseous contaminants

2. Liquid contaminants
3. Particulate contaminants

(A) 1 only (B) 2 only (C) 3 only (D) 1, 2 and 3

48. The frequency range for hearing the sound by a human ear is in the range of

(A) 20 Hz - 200 kHz (B) 10 Hz - 20 kHz (C) 20 Hz - 20 kHz (D) 10 Hz - 20 Hz

49. The transition region between unsaturated zone and saturated zone is called

(A) Capillary fringe (B) Water table

(C) Yadose water zone (D) Confining bed

50. Indirect cost due to accidents includes

(A) Legal charges

(B) Medical expenses for the injured

(C) Compensation amount to the injured

(D) Over time payment to make up the loss of time

x-x-x

ROUGH WORK

Computer Science & Engineering(Ph.D.)

1. Mean, Median and Mode are
(A) Measures of Deviation (B) Measures of Dispersion
(C) Measures of Control Tendency (D) Measures of Central Tendency

2. The Purpose of Statistical Inference is:
(A) To collect sample data and use them to formulate hypotheses about a population
(B) To draw conclusion about populations and then collect sample data to support the conclusions
(C) To draw conclusions about populations from sample data
(D) To draw conclusions about the known value of population parameter

3. The full form of APA is _____.
(A) American Physical Association (B) American Psychological Association
(C) American Psychological Amendment (D) American Psychological Agreement

4. Which is an excel add-in that performs statistical analyses within an excel workbook.
(A) SPSS (B) MEGASTAT (C) WORKSHEET (D) CHATS

5. The format of thesis writing is the same as in
(A) Writing of Seminar representation
(B) Preparation of research paper/article
(C) A research dissertation
(D) Presenting a workshop/conference paper

6. What is the appropriate statistical test to test the association between two categorical variables in a research study?
(A) T-test (B) ANOVA (C) Regression Analysis (D) Chi-square test

7. Which is an example of a quantitative research method.
(A) Case study (B) Ethnography
(C) Correlational Study (D) Phenomenological study

8. Which of the following is an example of a qualitative research question?
(A) What is the prevalence of depression in college students?
(B) How does gender influence job satisfaction?
(C) What is the relationship between income and happiness?
(D) What are the factors that contribute to successful weight loss?

9. What is the appropriate statistical analysis for comparing means between two groups?
(A) Chi-squared test (B) Analysis of variance (ANOVA)
(C) Regression analysis (D) T-test

10. A researcher is interested in studying the prospects of a particular political party in an urban area. So, what tool should he prefer for the study?
(A) Rating Scale (B) Interview (C) Questionnaire (D) Schedule

11. Which of the following statistical tests is appropriate to test the relationship between two continuous variables while controlling other variables?
(A) T-test (B) ANOVA (C) Chi-square test (D) Regression Analysis

12. What is the main purpose of a pilot study in research?
(A) To gather primary data (B) To establish the sample size
(C) To test the research hypothesis (D) To refine the research methodology

13. The answers from respondents of the questionnaire are run in software called _____.
(A) BLAST (B) SPSS (C) APSSP (D) MEGA5

14. Which of the following sampling methods is appropriate to study the prevalence of AIDS amongst males and females in India in 1992, 2002, 2012 and 2022?
(A) Cluster sampling (B) Systematic sampling
(C) Quota sampling (D) Stratified random sampling

15. The first step of research is:
(A) Selecting a problem (B) Searching a problem
(C) Finding a problem (D) Identifying a problem

16. To test null hypothesis, a researcher uses:
(A) t test (B) ANOVA (C) $X2$ (D) factorial analysis

17. A null hypothesis is
(A) Hypothesis of no difference
(B) Hypothesis that assigns value of zero to the variable
(C) Hypothesis of zero significance
(D) Hypothesis which can neither be proved nor disproved

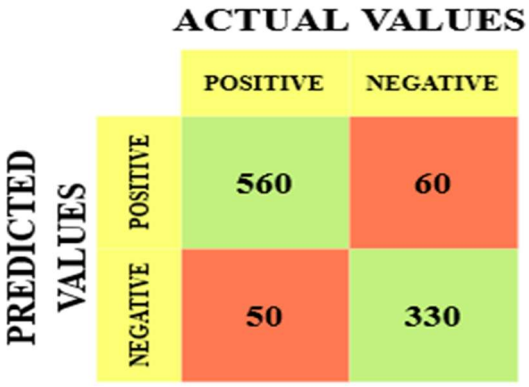
18. Inferring about the whole population on the basis of the observations made on a small part is called
(A) deductive inference (B) inductive inference
(C) objective inference (D) pseudo-inference

19. If according to the hypothesis, the result should be positive, but in fact it is negative, then it is known as_____

(A) False Negative Hypothesis (B) False Positive Hypothesis

(C) Specialized Hypothesis (D) Consistent Hypothesis

20. Which statement is CORRECT for the given confusion matrix:



(A) TP=560, TN=60, FP=50, FN=330
(B) TP=560, TN=330, FP=60, FN=50

(C) TP=560, TN=50, FP=330, FN=60

(D) TP=560, TN=330, FP=50, FN=60

21. Which of the following is an example of a dimensionality reduction technique?

(A) Principal component analysis (PCA) (B) Support vector machine (SVM)
(C) K-nearest neighbors (KNN) (D) AdaBoost

22. Which of the following is an example of an unsupervised learning problem?

(A) Predicting the stock market (B) Recommending products to users
(C) Spam filtering (D) Sentiment analysis

23. What is the purpose of the confusion matrix in machine learning?

(A) To visualize the distribution of the data in a dataset
(B) To compare the performance of different models
(C) To evaluate the performance of a classification model
(D) To evaluate the performance of a regression model

24. Which of the following is not the method of Research?

(A) Survey (B) Historical (C) Observation (D) Philosophical

25. A formal document that presents the research objectives, design of achieving these objectives, and the expected outcomes/deliverables of the study is called

(A) Research design (B) Research proposal

(C) Research hypothesis (D) Research report

26. Which of the given languages is not commonly used for AI?

(A) LISP (B) PROLOG (C) Python (D) Perl

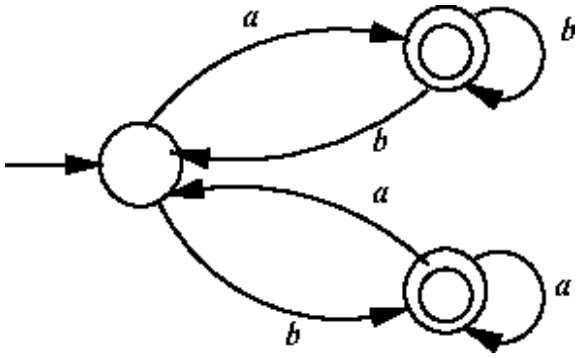
27. Who is known as the -Father of AI"?

(A) Fisher Ada (B) Alan Turing (C) John McCarthy (D) Allen Newell

28. ChatGPT Model is trained using

(A) HTTP (B) PPP (C) RLHF (D) LLHF

29. Which one of the following regular expressions correctly represents the language of the finite automaton given below?



(A) $ab^*bab^* + ba^*aba^*$ (B) $(ab^*b)^*ab^* + (ba^*a)^*ba^*$

(C) $(ab^*b + ba^*a)^*(a^* + b^*)$ (D) $(ba^*a + ab^*b)^*(ab^* + ba^*)$

30. A file is organized so that the ordering of data records is the same as or close to the ordering of data entries in some index. Then that index is called

(A) Dense (B) Sparse (C) Clustered (D) Unclustered

31. In an Entity-Relationship (ER) model, suppose R is a many-to-one relationship from entity set E1 to entity set E2. Assume that E1 and E2 participate totally in *R* and that the cardinality of E1 is greater than the cardinality of E2.

Which one of the following is correct about E2?

(A) Some entities in E1 are associated with more than one entity in E2.
(B) Every entity in E2 is associated with exactly one entity in E1.
(C) Every entity in E2 is associated with at most one entity in E1.
(D) Every entity in E1 is associated with exactly one entity in E2.

32. The primary key on table EMP is the EMPNO column. Which of the following statements will not use the associated index on EMPNO?

(A) select * from EMP where nvl(EMPNO, '00000') = '59384';

(B) select * from EMP where EMPNO = '59384';

(C) select EMPNO, LAST_NAME from EMP where EMPNO = '59384';

(D) select 1 from EMP where EMPNO = '59834';

33. Consider the following relation

Cinema(theater, address, capacity)

Which of the following options will be needed at the end of the SQL query

```
SELECT P1.address
FROM Cinema P1
```

such that it always finds the addresses of theaters with maximum capacity?

(A) Where P1. capacity >= Any (select P2.capacity from Cinema P2)
(B) Where P1. capacity >= All (select P2.capacity from Cinema P2)
(C) Where P1. capacity >= All (select max (P2.capacity) from Cinema P2)
(D) Where P1. capacity >= Any (select max (P2.capacity) from Cinema P2)

34. Consider the following two tables and four queries in SQL.

Book (isbn, bname), Stock (isbn, copies)

Query 1:
```
SELECT B.isbn, S.copies
FROM Book B INNER JOIN Stock S
ON B.isbn = S.isbn;
```

Query 2:
```
SELECT B.isbn, S.copies
FROM Book B LEFT OUTER JOIN Stock S
ON B.isbn = S.isbn;
```

Query 3:
```
SELECT B.isbn, S.copies
FROM Book B RIGHT OUTER JOIN Stock S
ON B.isbn = S.isbn;
```

Query 4:
```
SELECT B.isbn, S.copies
FROM Book B FULL OUTER JOIN Stock S
ON B.isbn = S.isbn;
```

Which one of the queries above is certain to have an output that is a superset of the outputs of the other three queries?

(A) Query 1 (B) Query 2 (C) Query 3 (D) Query 4

35. Consider the following where clause

```
WHERE A.no=B.no(+)
```

The above outer join lists

(A) All matching and non-matching rows of table B
(B) All matching and non-matching rows of table A
(C) All non-matching rows of table B

(D) All non-matching rows of table A

36. Which one of the following kinds of derivation is used by LR parsers?

(A) Rightmost (B) Leftmost in reverse

(C) Rightmost in reverse (D) Leftmost

37. Which one of the following facilitates transfer of bulk data from hard disk to main memory with the highest throughput?

(A) DMA based I/O transfer (B) Interrupt driven I/O transfer

(C) Polling based I/O transfer (D) Programmed I/O transfer

38. Which languages necessarily need heap allocation in the runtime environment?

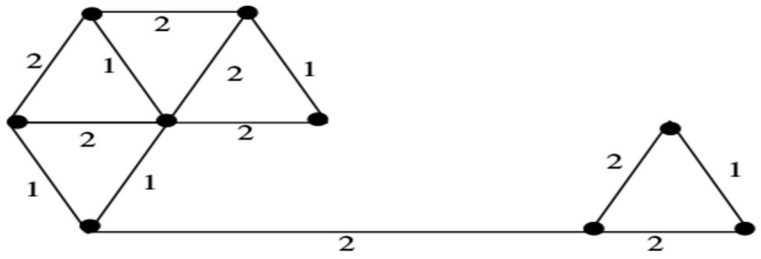
(A) Those that support recursion

(B) Those that use dynamic scoping

(C) Those that allow dynamic data structures

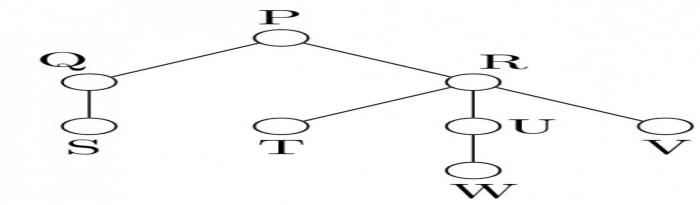
(D) Those that use global variables

39. The number of distinct minimum spanning trees for the weighted graph below is __



(A) 6 (B) 7 (C) 5 (D) 8

40. Consider the following rooted tree with the vertex P labeled as root



The order in which the nodes are visited during in-order traversal is

(A) SQPTRWUV (B) SQPTURWV (C) SQPTWUVR (D) SQPTRUWV

41. The preorder traversal sequence of a binary search tree is 30, 20, 10, 15, 25, 23, 39, 35, 42. Which one of the following is the postorder traversal sequence of the same tree?

(A) 10, 20, 15, 23, 25, 35, 42, 39, 30 (B) 15, 10, 25, 23, 20, 42, 35, 39, 30

(C) 15, 20, 10, 23, 25, 42, 35, 39, 30 (D) 15, 10, 23, 25, 20, 35, 42, 39, 30

42. To implement Dijkstra's shortest path algorithm on unweighted graphs so that it runs in linear time, the data structure to be used is:

(A) Queue (B) Stack (C) Heap (D) B-Tree

43. Hashing collision resolution techniques are

(A) Huffman coding, linear hashing
(B) Bucket addressing, Huffman coding
(C) Chaining, Huffman coding
(D) Chaining, Bucket addressing

44. Applications of Linked List are

(A) Simulation, event driven systems
(B) Postfix and prefix manipulations
(C) Dictionary systems, polynomial manipulations
(D) Fixed block storage allocation, garbage collection

45. Consider an arbitrary set of CPU-bound processes with unequal CPU burst lengths submitted at the same time to a computer system. Which one of the following process scheduling algorithms would minimize the average waiting time in the ready queue?

(A) Shortest remaining time first
(B) Round-robin with time quantum less than the shortest CPU burst
(C) Uniform random
(D) Highest priority first with priority proportional to CPU burst length

46. Consider a process executing on an operating system that uses demand paging. The average time for a memory access in the system is M units if the corresponding memory page is available in memory, and D units if the memory access causes a page fault. It has been experimentally measured that the average time taken for a memory access in the process is X units.

Which one of the following is the correct expression for the page fault rate experienced by the process?

(A) $(D - M) / (X - M)$ (B) $(X - M) / (D - M)$
(C) $(D - X) / (D - M)$ (D) $(X - M) / (D - X)$

47. On a disk with 1000 cylinders (0 to 999) find the number of tracks, the disk arm must move to satisfy all the requests in the disk queue. Assume the last request service was at track 345 and the head is moving toward track 0. The queue in FIFO order contains requests for the following tracks : 123, 874, 692, 475, 105, 376(Assume SCAN algorithm)

(A) 2013 (B) 1219 (C) 1967 (D) 1507

48. Consider a logical address space of 8 pages of 1024 words mapped with memory of 32 frames. How many bits are there in the physical address?

(A) 9 bits (B) 11 bits (C) 14 bits (D) 15 bits

49. In a system, there are three types of resources: *E, F* and *G*. Four processes *P0, P1, P2* and *P3* execute concurrently. At the outset, the processes have declared their maximum resource requirements using a matrix named Max as given below. For example, Max[*P2,F*] is the maximum number of instances of *F* that *P2* would require. The number of instances of the resources allocated to the various processes at any given state is given by a matrix named Allocation.

Consider a state of the system with the Allocation matrix as shown below, and in which 3 instances of *E* and 3 instances of *F* are the only resources available.

Process Id	*Allocation*			*Max*		
	E	*F*	*G*	*E*	*F*	*G*
P0	1	0	1	4	3	1
P1	1	1	2	2	1	4
P2	1	0	3	1	3	3
P3	2	0	0	5	4	1

From the perspective of deadlock avoidance, which one of the following is satisfied?

(A) The system is in *safe* state
(B) The system is not in *safe* state, but would be *safe* if one more instance of *E* were available
(C) The system is not in *safe* state, but would be *safe* if one more instance of *F* were available
(D) The system is not in *safe* state, but would be *safe* if one more instance of *G* were available

50. Consider the following solution to the producer-consumer synchronization problem. The shared buffer size is N. Three semaphores *empty*, *full* and mutex are defined with respective initial values of 0, N and 1. Semaphore *empty* denotes the number of available slots in the buffer, for the consumer to read from. Semaphore *full* denotes the number of available slots in the buffer, for the producer to write to. The placeholder variables, denoted by P, Q, R, and S, in the code below can be assigned either *empty* or *full*. The valid semaphore operations are: *wait() and signal().*

Producer:	Consumer:

do{
wait(P);
wait(mutex);
//Add item to buffer
signal(mutex);
signal(Q);
}while(1);
	do{
	wait(R);
	wait(mutex);
	//Consume item from buffer signal(mutex);
	signal(S);
	}while(1);

Which one of the following assignments to P, Q, R and S will yield the correct solution?

(A) P: full, Q: full, R: empty, S: empty
(B) P: empty, Q: empty, R: full, S: full
(C) P: full, Q: empty, R: empty, S: full
(D) P: empty, Q: full, R: full, S: empty

x-x-x

ROUGH WORK

Electronics & Communication Engineering(Ph.D.)

1. Mode refers to the value within a series that occurs _____ number of times.
(A) Maximum (B) Minimum (C) Zero (D) Infinite

2. While calculating the standard deviation, the deviations are only taken from.
(A) The mode value of a series (B) The median value of a series
(C) The quartile value of a series (D) The mean value of a series

3. Find the value of the third quartile when the first quartile is 104 and the quartile deviation is 8.
(A) 136 (B) 146 (C) 120 (D) 130

4. To determine whether the test statistic of ANOVA is statistically significant, it can be compared to a critical value. What two pieces of information are needed to determine the critical value?
(A) Sample size, number of groups
(B) Mean, sample standard deviation
(C) Expected frequency, obtained frequency
(D) MSTR, MSE

5. When conducting a one-way ANOVA, the _____ the between-treatment variability is when compared to the within-treatment variability, the _____ the value of FDATA will be tend to be.
(A) smaller, larger (B) smaller, smaller
(C) larger, larger (D) smaller, more random

6. For the chi-square test to be effective, the expected value for each cell in the contingency table has to be at least
(A) 3 (B) 5 (C) 10 (D) 8

7. The number of parameters in Chi-Square distribution is
(A) 1 (B) 4 (C) 3 (D) 2

8. For a 3×3 contingency table, the degrees of freedom is
(A) 3 (B) 6 (C) 9 (D) 4

9. A _____ error is made if H1 is true but H0 is accepted
(A) Type-I (B) Type-II
(C) Sampling error (D) The standard error of the mean

10. The probability of rejecting a true hypothesis is called
(A) Critical region (B) Level of significance
(C) Test statistics (D) Statement of hypothesis

11. If population standard deviation is known and n>30 then appropriate test statistics mean comparison is
(A) t-test (B) F-test (C) Z-test (D) chi2-test

12. The null hypothesis of the sign test is that
(A) Half the ranks to be less than the median and half greater than the median
(B) Half the ranks to be less than the mean and half greater than the mean
(C) The lower half the ranks to have the same mean as the upper half
(D) The lower half the ranks to have the same standard deviation as the upper half

13. Confidence intervals are a function of which of the following three things
(A) The population, the sample, and the standard deviation
(B) The sample, the variable of interest, and the degrees of freedom
(C) The data in the sample, the confidence level, and the sample sized
(D) The sampling distribution, the confidence level, and the degrees of freedom

14. If you increase the confidence level, the confidence interval.
(A) decreases
(B) increases
(C) stays the same
(D) may increase or decrease, depending on the sample data

15. As the sample size increases, the t distribution becomes more similar to the _____ distribution.
(A) normal (B) exponential (C) F (D) chi-square

16. The normal approximation to the binomial distribution is most useful for finding which of the following?
(A) The probability $P(X = k)$ when X is a binomial random variable with large n.
(B) The probability $P(X \leq k)$ when X is a binomial random variable with large n.
(C) The probability $P(X = k)$ when X is a normal random variable with small n.
(D) The probability $P(X \leq k)$ when X is a normal random variable with small n.

17. Which one of the following probabilities is a "cumulative" probability?
(A) The probability that there are exactly 4 people with Type O+ blood in a sample of 10 people.
(B) The probability of exactly 3 heads in 6 flips of a coin.
(C) The probability that the accumulated annual rainfall in a certain city next year, rounded to the nearest inch, will be 18 inches.
(D) The probability that a randomly selected woman's height is 67 inches or less.

18. If two events (both with probability greater than 0) are mutually exclusive, then:
(A) They also must be complements (B) They also could be complements
(C) They cannot be complements (D) They also could be independent

19. If X and Y are independent random variables, then E(XY) is equal to which of the following?
(A) E(X)+E(Y) **(B)** E(X)*E(Y)
(C) [E(X)+E(Y)] / sqrt[{E(X)*E(Y)}] (D) [E(X)-E(Y)] / sqrt[{E(X)*E(Y)}]

20. The value which occurs with the maximum frequency is called ____.

(A) Cumulative frequency (B) Quartile

(C) Mode (D) Median

21. What is the purpose of a research hypothesis?

(A) To summarize the research findings (B) To provide a rationale for the study

(C) To guide the data analysis process (D) To establish the research design

22. Which of the following is an example of a non-probability sampling technique?

(A) Simple random sampling (B) Stratified sampling

(C) Convenience sampling (D) Cluster sampling

23. Which of the following is a measure of dispersion?

(A) Mean (B) Median (C) Standard deviation (D) Mode

24. What is the difference between a population and a sample in research?

(A) A population refers to a subset of individuals, while a sample includes all individuals.

(B) A population includes all individuals, while a sample refers to a subset of individuals.

(C) Population and sample are the same concepts and can be used interchangeably.

(D) Population and sample are not important considerations in research.

25. What is the purpose of randomization in experimental research?

(A) To ensure that the sample is representative of the population

(B) To eliminate selection bias

(C) To increase the generalizability of the findings

(D) To control for confounding variables

26. A digital multimeter reads 5 V when fed with a triangular wave, which is symmetric about the time-axis. What will be the rms and average reading?

(A) 5/√3, 5/3 (B) 5/√2, 5/2 (C) 5,5 (D) 5/2, 5/√3

27. Transient current in an RLC circuit is oscillatory when

(A) $R > 2\sqrt{\frac{L}{C}}$ (B) R = 0 (C) $R < 2\sqrt{\frac{L}{C}}$ (D) $R = 2\sqrt{\frac{L}{C}}$

28. N-channel MOSFET threshold voltage is _____ by adding extra p type impurity and is _____ by implanting n-type impurities.

(A) Decreased, Increased (B) Increased, Decreased

(C) Decreased, not affected (D) Remain same, Increased

29. The impulse response of filter matched to the signal $s(t) = g(t) - \delta(t - 2)*g(t)$ is given as:

(A) $s(1 - t)$ (B) $-s(1 - t)$ (C) $-s(t)$ (D) $s(t)$

30. The circular convolution of both of these sequences X1(n)={2,1,2,1} and x2(n)={1,2,3,4} would be:

(A) {14,16,14,16} (B) {2,3,6,4} (C) {16,16,14,14} (D) {14,14,16,16}

31. In a semiconductor, if the Fermi energy level lies within the conduction band then the semiconductor is known as

(A) Degenerate n type (B) Degenerate p type

(C) Non- Degenerate n type (D) Non-Degenerate p type

32. The loop transfer function of a negative feedback system is

$$G(s)H(s) = \frac{K(s+11)}{s(s+2)(s+8)}$$

The value of K, for which the system is marginally stable, is _____.

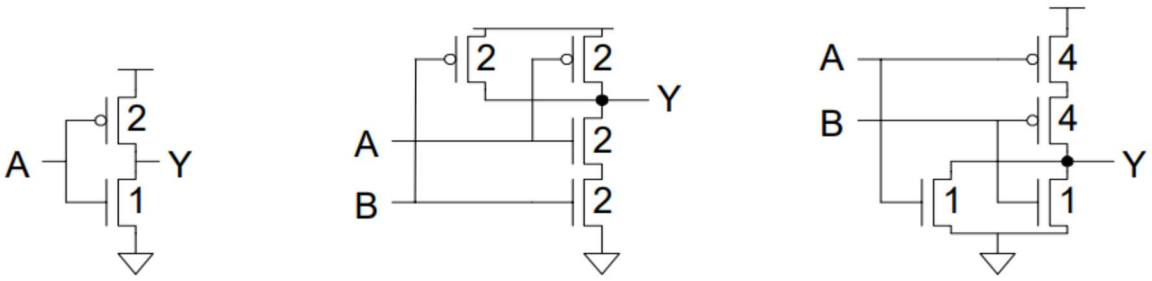
(A) 100 (B) 140 (C) 160 (D) 200

33. Consider a system with input x(t) and output $y(t) = x(e^t)$, the system is

(A) causal and time invariant (B) non causal and time varying

(C) causal and time varying (D) non causal and time invariant

34. What is the logical effort value of these 3 circuit diagrams



(A) 4/3, 2/3, 3/3 (B) 2/3, 2/3, 3/3 (C) 3/3, 4/3, 5/3 (D) 5/3, 2/3, 3/3

35. Using four cascaded counters with a total of 16 bits, how many states must be deleted to achieve a modulus of 50,000?

(A) 50,000 (B) 65,536 (C) 25,536 (D) 15,536

36. Which of the following logic families has the shortest propagation delay?

(A) CMOS (B) BiCMOS (C) ECL (D) 74SXX

37. Assertion (A): In FM the frequency of the carrier is varied by the modulating voltage
Reason (R): FM and PM are two forms of angle modulation.

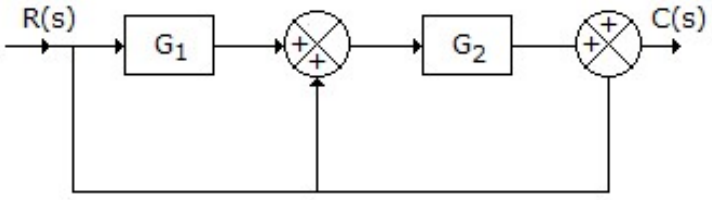
(A) Both A and R are correct and R is correct explanation of A

(B) Both A and R are correct but R is not correct explanation of A

(C) A is correct but R is wrong

(D) A is wrong but R is correct

38. For the system in the given figure. The transfer function C(*s*)/R(*s*) is

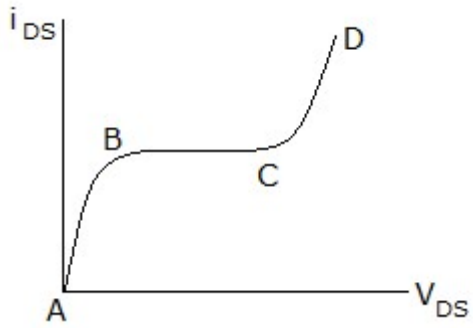


(A) $G_1 + G_2 + 1$ (B) $G_1 G_2 + 1$ (C) $G_1 G_2 + G_2 + 1$ (D) $G_1 G_2 + G_1 + 1$

39. The minority carrier life time and diffusion constant in a semiconductor material are respectively 100 microsecond and 100 cm^2/sec. The diffusion length is

(A) 0.1 cm (B) 0.01 cm (C) 0.0141 cm (D) 1 cm

40. The *v-i* characteristics of a FET is shown in figure. In which region is the device biased for small signal amplification



(A) AB (B) BC (C) CD (D) BD

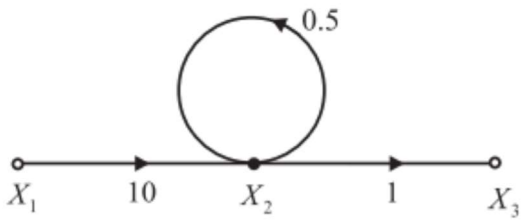
41. A loss less line of characteristic impedance Z_0 is terminated in pure reactance of $-jZ_0$ value. VSWR is

(A) 10 (B) 2 (C) 1 (D) infinity

42. A 10 km long line has a characteristic impedance of 400 ohms. If line length is 100 km, the characteristic impedance is

(A) 4000 ohms (B) 400 ohms (C) 40 ohms (D) 4 ohms

43. For the signal flow graph shown in figure, X_3/X_1 is



(A) 18 (B) 19 (C) 20 (D) 21

44. Which of the following is not related to Kerr effects?

(A) Self-phase modulation (B) Cross-phase modulation

(C) Four-wave mixing (D) Stimulated Raman Scattering

45. Laplace transform of $\{t \cos at\}$ is:

$(A)\ \frac{s^2-a^2}{(s^2+a^2)^2}$ $(B)\ \frac{2as^2}{(s^2+a^2)^2}$ $(C)\ \frac{2as}{(s^2+a^2)}$ $(D)\ \frac{s^2}{(s^2+a^2)^2}$

46. Which of the following oscillators is suitable for frequencies in the range of megahertz?

(A) RC phase shift (B) Wien bridge (C) Hartley (D) Both (A) and (C)

47. In a FM waveform, the side bands are spaced at intervals equal to

(A) half the modulating frequency (B) four times the modulating frequency

(C) twice the modulating frequency (D) modulating frequency

48. Find the radiation resistance of an antenna of length λ/10 meter?

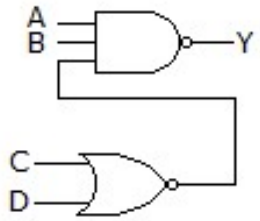
(A) 8 Ω (B) 780 Ω (C) 7.8 Ω (D)78 Ω

49. An 8085 assembly language program is given below. Assume that the carry flag is initially unset. The content of the accumulator after the execution of the program is

```
MVI A,07H
RLC
MOV B,A
RLC
RLC
ADD B
RRC
```

(A) 8CH (B) 23H (C) 64H (D) 15H

50. In the given figure, A=B=1 and C=D=0. Then Y=



(A) 1 (B) 0 (C) either 1 or 0 (D) Indeterminate

x-x-x

ROUGH WORK

Food Technology(Ph.D)

1. The F-test:
(A) Is essentially a two-tailed test.
(B) Is essentially a one-tailed test.
(C) Can be one-tailed as well as two-tailed depending on the hypotheses.
(D) Can never be one-tailed test.

2. _____ is one of the effective ways to avoid plagiarism.
(A) Site (B) Cite (C) Resource (D) Copy

3. A Research Report is a formal statement of:
(A) Research process (B) Research problem
(C) Data collection (D) Data editing

4. _____ is a reference to a published or unpublished source.
(A) Citation (B) Footnotes (C) Bibliography (D) Acknowledgement

5. A researcher conducted a study to have an initial idea of the scope and magnitude of the problem under study and to test the feasibility of more extensive research. Such a study is called:
(A) Explanatory study (B) Confirmatory study
(C) Descriptive study (D) Experimental study

6. Research design that needs to collect factual information on a continuing basis is classified as:
(A) Longitudinal study design (B) Pre and post-study design
(C) Cross-sectional study design (D) Double-control study design

7. In ANOVA, treatment refers to:
(A) Experimental units (B) Different levels of a factor
(C) A factor (D) Variance

8. A member of the population is known as:
(A) Data (B) Family (C) Element (D) Group

9. What is the key feature of probability sampling that distinguishes it from nonprobability sampling?
(A) Selection of very large samples (B) Use of random selection
(C) Elimination of sampling error (D) Contribution to theoretical understanding

10. _____ is not a non-probability sampling.
(A) Judgemental sampling (B) Convenience sampling
(C) Extensive sampling (D) Cluster sampling

11. Non probability form of sampling is:
(A) Random sampling (B) Non random sampling
(C) Probability sampling (D) Quota sampling

12. The standard deviation of the sampling distribution of any statistic is called:
(A) Sampling error (B) Type-I error
(C) Standard error (D) Non-sampling error

13. _____ is not a level of measurement.
(A) Nominal scale (B) Ordinal scale
(C) Internal scale (D) Ratio scale

14. Major problem with all types of scaling is:
(A) Definition of the continuum (B) Reliability
(C) Weighting of items (D) The nature of the item

15. _____ is a statement about a population developed for the purpose of testing.
(A) Hypothesis (B) Test-statistic
(C) Level of significance (D) Level of confidence

16. Null hypothesis is rejected if the value of a test statistic lies in the:
(A) Rejection region (B) Acceptance region
(C) Confidence coefficient (D) Critical region

17. _____ is the number of independent values in a set of values.
(A) Test statistic (B) Level of significance
(C) Degree of freedom (D) Level of confidence

18. The term data came from the Latin term:
(A) Detem (B) Datam (C) Datum (D) Data

19. Data collected for the first time from the source of origin is called:
(A) Primary data (B) Secondary data (C) Internal data (D) External data

20. Report use feature such as:
(A) Mobile (B) Method (C) Account (D) Graphics and images

21. Full form of DOI in research publications
(A) Digital object identifier (B) Date of issue
(C) Date of incorporation (D) Digitalization of the issue

22. Report discuss a particular problem in:
(A) Brief (B) Detail
(C) Complicated manner (D) Horizontal way

23. In ANOVA F-distribution is derived from:
(A) t-distribution (B) w-distribution (C) z-distribution (D) x-distribution

24. A specific combination of factor levels whose effect is to be compared with other treatments is called:
(A) Factor (B) Treatment (C) Permutation (D) Effect

25. Performing the same treatment combination more than once is called :
(A) Recitation (B) Randomization (C) Repatriation (D) Replication

26. Purpose of milk's heat treatment is:

(A) To heat the milk (B) Taste enhancement

(C) Evaporation (D) To kill pathogenic microorganisms

27. Freezing point helps to check _____ of adulterated milk.

(A) Water adulteration (B) Sugar adulteration

(C) Color adulteration (D) Gas adulteration

28. _____ is the freezing point of milk.

(A) 0 °C (B) -4 °C (C) 4 °C (D) -0.550 °C

29. _____ provides energy very slowly.

(A) Fats (B) Proteins (C) Carbohydrates (D) Fibers

30. Cereals are a major source of_____.

(A) Fat (B) Protein (C) Amino acid (D) Carbohydrate

31. _____ was the first food technologist who wrote the book on food preservation.

(A) Alexander Fleming (B) Louis Pasture

(C) Nicolas Appert (D) K. T. Achaya

32. _____ is the precursor of vitamin A.

(A) Chlorophyll (B) Anthocyanin (C) Beta-carotene (D) Lycopene

33. Which type of packaging is appropriate for fruits?

(A) Ethylene absorbers (B) Nitrogen producing

(C) Oxygen absorbers (D) CO_2 absorbers

34. Stationary phase is described as:

(A) No further increase in the cell population after a maximum value

(B) Deceleration of growth and division rate after growth rate reaches a maximum value

(C) Acceleration of growth and division rate after growth rate reaches a maximum value

(D) Deceleration of growth and division rate after growth rate reaches a minimum value

35. A fed batch reactor initially contains 4 litre of medium. If it was fed 2 litre per hour for 5 hours, then the volume of the reactor at the end will be:

(A) 10 litre (B) 4 litre (C) 7 litre (D) 14 litre

36. FSSAI stands for:

(A) Food Safety and standards authority of India

(B) Food standard and safety authority of India

(C) Food storage and standards authority of India

(D) Fruits safety and standards authority of India

37. Which of the following operation reduces the dietary fibre content in cereals?

(A) Drying (B) Retro-gradation (C) Grinding (D) Milling

38. Subjecting fats to high temperature in the presence of oxygen leading to fats deterioration is called?

(A) Hydrolytic rancidity (B) Auto-oxidation

(C) Thermal decomposition (D) Lypolysis

39. The most common food preservation method is:
(A) Freezing (B) Heating (C) Fermentation (D) Freeze drying

40. Fermentation of glycerol in wine results in:
(A) Mousy flavour (B) Amertume (C) Pousse (D) Tourne

41. _____ is the process of converting sugar into alcohol.
(A) Fermentation (B) Bleaching (C) Pasteurisation (D) Oxidation

42. SWOT stands for:
(A) Strength, weaknesses, opportunities, threats
(B) Strength, weaknesses, opportunities, time
(C) Strength, weaknesses, overall, time
(D) Strength, work, opportunities, threats

43. Which of the following metallic ions has a potential for antimicrobial effect and is used in active packaging?
(A) Mg (B) Fe (C) Ag (D) Na

44. _____ is considered as primary packaging.
(A) Inner Packing (B) Individual packaging
(C) External packaging (D) Separate packaging

45. Which of the following is not a functional food?
(A) Pills or capsules or sachets of foods as a part of daily diet
(B) Omega-3 polyunsaturated fatty acids
(C) Probiotics
(D) Dietary fiber

46. A small amount of starch not digested in the small intestine is called:
(A) Resistant starch (B) Modified starch
(C) Gelatinized starch (D) Dextrified starch

47. _____ is the performance parameter for the food industry.
(A) Hygiene (B) Labour used
(C) Recommended daily allowance (D) Both (A) and (B)

48. FSS stands for?
(A) Food set and sound (B) Food secure and safe
(C) Food safety and standards (D) Food sour and sign

49. _____ deals with how food is adjudged by the consumer.
(A) Food microbiology (B) Product development
(C) Sensory analysis (D) Food physics

50. Recommended daily allowance (RDA) values in India are determined by:
(A) Pharmacy Council of India (B) Indian Council of Medical Research
(C) Medical Council of India (D) Department of Biotechnology

x-x-x

ROUGH WORK

Industrial Chemistry(Ph.D)

1. Research is

(A) Searching again and again
(B) Finding solution to any problem
(C) Working in a scientific way to search for truth of any problem
(D) A procedure

2. …… is concerned with discovering and testing certain variables with respect to their association or disassociation

(A) Exploratory
(B) Descriptive
(C) Diagnostic
(D) Descriptive and diagnostic

3. What is a research design?

(A) The choice between using qualitative or quantitative methods
(B) A way of conducting research that is not grounded in theory
(C) The style in which you present your research findings, e.g. a graph
(D) A framework for every stage of the collection and analysis of data

4. Preliminary data collection is a part of the_____

(A) Descriptive research
(B) Exploratory research
(C) Applied research
(D) Explanatory research

5. In the process of conducting research 'Formulation of Hypothesis" is followed by

(A) Statement of Objectives
(B) Selection of Research Tools
(C) Collection of Data
(D) Analysis of Data

6. The positional average is

(A) mode
(B) median
(C) mean
(D) harmonic mean

7. Closed ended questions are those that

(A) Have a fixed range of possible answers
(B) Prevent respondents from allocating themselves to a category
(C) Encourage detailed, elaborate responses
(D) Relate to the basic demographic characteristics of respondents

8. An image, perception or concept that is capable of measurement is called

(A) Scale
(B) Hypothesis
(C) Type
(D) Variable

9. In an experimental design, the dependent variable is:

(A) The one that is not manipulated and in which any changes are observed

(B) The one that is manipulated in order to observe any effects on the other

(C) A measure of the extent to which personal values affect research

(D) An ambiguous concept whose meaning depends on how it is defined

10. In order to pursue the research, which of the following is priorly required

(A) Developing a research design

(B) Formulating a research question

(C) Deciding about the data analysis procedure

(D) Formulating a research hypothesis

11. The median of a series of numerical values is

(A) The value located exactly midway between the minimum and maximum of the series

(B) The most commonly encountered values among the series

(C) A value for which half of the values are higher and half of the values are lower

(D) A measure of the eccentricity of the series

12. A regression line is a straight line which

(A) is located as close as possible to all the points of a scatter chart

(B) passes through all the data points

(C) provides a relationship between the values of two parameters

(D) is parallel to one of the coordinate axes

13. Standard deviation

(A) is measured using the squared unit of the variable

(B) is measured using the unit of the variable

(C) has values generally comparable with the average value

(D) is the square root of variance

14. What is a cross-sectional design?

(A) A study of one particular section of society, e.g. the middle classes

(B) One that is devised when the researcher is in a bad mood

(C) The collection of data from more than one case at one moment in time

(D) A comparison of two or more variables over a long period of time

15. Which of the following is a measure of variation?

(A) standard deviation

(B) midrange

(C) mode

(D) median

16. If the average of a series of values is 10 and their variance is 4, then the coefficient of variation is

(A) 40% (C) 80%
(B) 20% (D) 10%

17. The width of a class interval in a frequency distribution will be approximately equal to the range of the data divided by the
(A) highest value in the data set (C) number of class intervals
(B) lowest value in the data set (D) average of the data set

18. Conducting multiple t- tests increases the likelihood of which of the following?
(A) finding correct conclusions (C) homogeneity
(B) type 1 error (D) type II error

19. Factorial designs allow us to study both _____ effects of the independent variables on the dependent variables.
(A) main and interactive (C) symbiotic and dichotomous
(B) dependent and independent (D) rank order and correlational

20. The coefficient of skewness is always zero for_____ distribution
(A) symmetrical (C) median
(B) skewed (D) none

21. What is the appropriate statistical test for a factorial design?
(A) the Modes test (C) *t*-test
(B) ANOVA (D) chi-square

22. Cluster sampling, stratified sampling and systematic sampling are types of
(A) Direct sampling (C) Random sampling
(B) Indirect sampling (D) Non random sampling

23. Which of the following is a method that is commonly used in qualitative research?
(A) Mailed questionnaire (C) Surveys
(B) Ethnography (D) Structured observation

24. The Student's t test is
(A) a parametric test (C) a test for comparing averages
(B) a nonparametric test (D) a test for comparing variances

25. What is listed in the first column of an ANOVA summary table?
(A) degrees of freedom (C) source of variation
(B) sums of squares (D) significance level

26. Chemical pulping mostly uses which of the following chemical?
(A) Sodium nitrate (C) Calcium carbonate
(B) Potassium hydroxide (D) Sodium hydroxide

I

27. The Grashof number is defined as the ratio of

(A) Buoyancy to inertial forces
(B) Buoyancy to viscous forces
(C) Inertial to viscous forces
(D) Buoyancy to surface tension forces

28. For a given ambient air temperature with increase in the thickness of insulation over hot cylindrical pipe, the rate of heat loss from the surface would

(A) Always decrease
(B) Always increase
(C) First decrease and then increase
(D) First increase and then decrease

29. Match **list-1** with **list-2** and select the correct answer:

List-1 (fertilizer)	List-2 (Amount of N)
A. Urea	1. 24%
B. Diammonium phosphate	2. 20%
C. Ammonium sulfate	3. 18%
D. Ammonium chloride	4. 46%

(A) A-4, B-3, C-2, D -1
(B) A-4, B-3, C-1, D-2
(C) A-1, B-2, C-4, D-3
(D) A-1, B-3, C-2, D-4

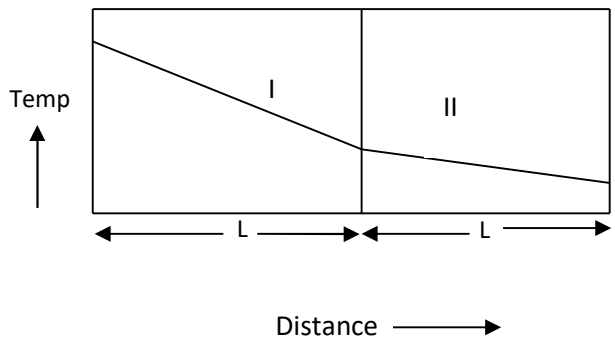
30. Bound moisture in a solid is that liquid which exerts an equilibrium vapour pressure

(A) Equal to that of pure liquid at the given temperature
(B) Less than that of pure liquid at the given temperature
(C) Greater than that of pure liquid at the given temperature
(D) Equal to or less than that of pure liquid at the given temperature

31. Beer Lambert's law gives the relation between which of the following?

(A) Reflected radiation and concentration
(B) Scattered radiation and concentration
(C) Energy absorption and concentration
(D) Energy absorption and reflected radiation

32. Steady state temperature variation in a plane wall, made of two different solids I and II, is shown below:



The thermal conductivity of material I

(A) Is smaller than that of II
(C) Is equal to that of II

(B) Is greater than that of II

(D) Can be greater than or smaller than that of II

33. Which of the following statements regarding the S_N2 mechanism is wrong?

(A) S_N2 reactions are bimolecular

(B) S_N2 reactions are usually second order

(C) The S_N2 mechanism occurs in one step

(D) S_N2 reactions usually occur in two steps

34. Two bodies A and B having equal surface areas are maintained at temperatures 10°C and 20°C. The thermal radiation emitted in a given time by A and B are in the ratio

(A) 1 : 1.15

(B) 1 : 4

(C) 1 : 2

(D) 1 : 16

35. For an ideal plate in a distillation column

(A) Vapor and liquid leaving streams are in equilibrium

(B) Vapor and liquid entering streams are in equilibrium

(C) Vapor leaving stream is in equilibrium with the liquid entering stream

(D) Vapor entering stream is in equilibrium with the liquid leaving stream

36. Heat transfer occurs by natural convection because change in temperature causes differences in

(A) Viscosity

(B) Density

(C) Thermal conductivity

(D) Heat capacity

37. Schmidt number is the ratio of

(A) Momentum diffusivity to mass diffusivity

(B) Mass diffusivity to momentum diffusivity

(C) Thermal diffusivity to mass diffusivity

(D) Momentum diffusivity to thermal diffusivity

38. Concentration of H^+ ions in a solution is 0.0001 mol. l^{-1}. The pH of the solution is

(A) 8

(B) 6

(C) 4

(D) 12

39. You look at an IR spectrum and see a collection of bands at 2800-2950 cm^{-1}. What conclusion can you draw about structure?

(A) The molecule contains oxygen

(B) The molecule contains a C=O bond

(C) The molecule contains aliphatic C-H bonds

(D) The molecule contains an O-H bond

40. In an operating electrochemical cell the function of a salt bridge is to

(A) allow hydrolysis to occur
(B) allow a non-spontaneous reaction to occur
(C) transfer electrons from the cathode to the anode
(D) permit the migration of ions within the cell

41. Under the same conditions

(A) $1m^3$ of dry air is lighter than $1m^3$ of humid air
(B) $1\ m^3$ of humid air is lighter than $1m^3$ of dry air
(C) Both $1m^3$ of dry air and $1m^3$ of humid air have the same weight
(D) Unpredictable

42. Ammonia synthesis gas is produced from natural gas by

(A) Thermal cracking
(B) Steam reforming
(C) Partial oxidation
(D) Hydrogenation

43. With decrease in temperature, the equilibrium conversion of a reversible endothermic reaction

(A) Decreases
(B) Increases
(C) Remains unaffected
(D) Increases linearly with temperature

44. As an element is oxidized, its oxidation number

(A) Increases as electrons are lost
(B) Increases as electrons are gained
(C) Decreases as electrons are lost
(D) Decreases as electrons are gained

45. Internal energy change of a system over one complete cycle in a cyclic process is

(A) +ve
(B) -ve
(C) dependent on the path
(D) Zero

46. Identify the correct statement regarding entropy

(A) At 0^0C, the entropy of a perfectly crystalline substance is taken to be zero
(B) At absolute zero of temperature, the entropy of all perfectly crystalline substances is positive
(C) At absolute zero of temperature, the entropy of all crystalline substances is taken to be negative
(D) At absolute zero of temperature, the entropy of a perfectly crystalline substance is taken to be zero

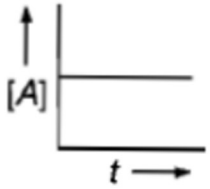
47. Turbidity of water is an indication of presence of

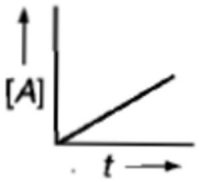
(A) Suspended inorganic matter
(B) Dissolved solids
(C) Floating solids
(D) Dissolved gases

48. What does the selectivity factor in chromatography describe?

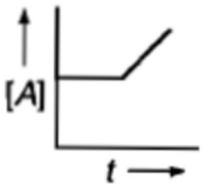
(A) The proportional difference in widths of two chromatographic peaks
(B) The maximum number of different species which a column can separate simultaneously
(C) The relative separation achieved between two species
(D) selectivity factor has nothing to do with chromatography

49. Which curve represents zero order reaction?

(A) 

(C) 

(B) 

(D) 

50. The half-life period for a first order reaction is 20 minutes. The time required to change the concentration of the reactants from 0.08 M to 0.01 M will be

(A) 20 minutes (C) 40 minutes

(B) 60 minutes (D) 50 minutes

x-x-x

ROUGH WORK

1. Which of the following best describes research methodology?
(A) Specific tools used to collect and analyze data
(B) Method for interpretation and validation of results
(C) Investigation aimed at discovery of knowledge
(D) Study of research methods encompassing problem definition, research design, experimentation, results and their validation

2. The sampling method that involves dividing population into different subgroups and selecting subjects from each subgroup in a proportionate manner, is known as____
(A) Random sampling (B) Stratified sampling
(C) Quota sampling (D) Group sampling

3. Which of the following is not a valid citation style for research papers?
(A) APA (B) IEEE (C) MLA (D) XML

4. What is the null hypothesis in research methodology?
(A) Null hypothesis is a type of statistical hypothesis that proposes that no statistical significance exists in a set of given observations.
(B) Null hypothesis states that there is strong relationship between two population parameters, i.e., an independent variable and a dependent variable.
(C) It is a statement of relationship between two parameters that cannot be proven or rejected.
(D) It is the statement defining the extraneous variables in research.

5. A type II error is said to occur when____
(A) Researcher fails to reject a false null hypothesis
(B) Researcher rejects a true null hypothesis
(C) Researcher rejects a false null hypothesis
(D) Researcher accepts a false null hypothesis

6. A research design that involves repeated observations of the same variables over long periods of time is known as_____
(A) Cross-sectional (B) Archival (C) Longitudinal (D) Correlational

7. Which of the following is not a characteristic of a good literature review?
(A) Critical review (B) Conciseness
(C) Only recent references (D) Only relevant references

8. Which of the following should not be a factor in determination of sample size?
(A) Convenience (B) Cost and Time
(C) Confidence level (D) Confidence interval

9. Which of the following statistical tests should be applied to determine whether two population means are different, given that sample size is large and variances are known?
(A) t-test (B) z-test (C) Spearman's rho (D) Granger test

10. What is the primary aim of research?
(A) To advance the knowledge in a field (B) To generate funds

(C) To acquire higher degree (D) To reaffirm known facts

11. Which of the following research helps to develop clear and precise statement of the research problem rather than provide a definitive answer?
(A) Introductory (B) Exploratory (C) Basic (D) One-time

12. Pick the odd one out:
(A) Convenience sampling (B) Snowball sampling
(C) Quota sampling (D) Random sampling

13. The variable that is changed and controlled in a scientific experiment is _____
(A) Dependent (B) Independent (C) Extraneous (D) Control

14. Using work or ideas from another source without giving credit and presenting them as your own work is known as_____
(A) Fabrication (B) Replication (C) Plagiarism (D) Misconduct

15. Which of the following is not a reference management software?
(A) Urkund (Ouriginal) (B) Mendeley
(C) BibTeX (D) EndNote

16. Unstructured or semi-structured techniques and subjective analysis are a part of____
(A) Qualitative research (B) Quantitative research
(C) Action research (D) Applied research

17. Dataset of anonymized COVID patient records available for researchers is an example of _____data
(A) Primary (B) Secondary (C) Private (D) Tertiary

18. Consider a set of 18 samples from a standard normal distribution. We square each sample and sum all the squares. The number of degrees of freedom for a Chi Square distribution will be?
(A) 17 (B) 18 (C) 19 (D) 20

19. A normal distribution is symmetric about its_____
(A) Mean (B) variance (C) standard deviation (D) covariance

20. Runs scored by batsman in 5 one day matches are 50, 70, 82, 93, and 20. The standard deviation is _____
(A) 25.69 (B) 25.49 (C) 25.29 (D) 25.79

21. Percentiles divide a series into _____.
(A) Ten equal parts (B) Twenty equal parts
(C) Fifty equal parts (D) Hundred equal parts

22. Which of the following can be used for variables without any quantitative value?
(A) Ratio (B) Ordinal (C) Nominal (D) Interval

23. What of the following is not an important component of a research paper?
(A) Related Work (B) Problem Definition
(C) Conclusion (D) Author Profile

24. The type of research that is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory is known as_____
(A) Basic research (B) Pure research
(C) Empirical research (D) Applied research

25. Which of the following type of histogram represents a normal distribution?
(A) Plateau (B) Flat (C) Skewed (D) Bell-shaped

26. Given that p the probability of a page fault in a system is close to zero, that is there are only few page faults. If the average page fault service time is 25 milliseconds and memory access time is 100 nanoseconds, then which of the following denotes the effective access time in nanoseconds?
(A) 100 + 24,999,900 x p (B) 24,999,990 x p
(C) 100 + 25,999,990 x p (D) 100 + 25,000,000 x p

27. Which one of the following statements is false:
(A) Any relation with two attributes is in BCNF
(B) A relation in which every key has only one attribute is in 2NF
(C) A prime attribute can be transitively dependent on a key in a 3NF relation
(D) A prime attribute can be transitively dependent on a key in a BCNF relation

28. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be:
(A) 255.255.0.0 (B) 255.255.64.0 (C) 255.255.128.0 (D) 255.255.252.0

29. In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to?
(A) Suspended state (B) Terminated state
(C) Ready state (D) Blocked state

30. Swapping _____ be done when a process has pending I/O, or has to execute I/O operations only into operating system buffers.
(A) must never (B) may be (C) can (D) must

31. The operating system keeps a small table containing information about all open files called _____
(A) file table (B) directory table (C) open-file table (D) system table

32. In Unix, which system call creates the new process?
(A) create (B) fork (C) new (D) wake

33. Which one of the following is the characteristic of a multimedia system?
(A) high storage (B) high data rates
(C) both high storage and high data rates (D) slow performance

34. What is the major drawback of anomaly detection IDS?
(A) These are very slow at detection (B) It generates many false alarms
(C) It doesn't detect novel attacks (D) None of the mentioned

35. When does the Array Index out of Bounds Exception occur?
(A) Compile-time (B) Run-time
(C) Not an error (D) Not an exception at all

36. What are the advantages of arrays?
(A) Objects of mixed data types can be stored
(B) Elements in an array cannot be sorted
(C) Index of first element of an array is 1
(D) Easier to store elements of same data type

37. The data structure required for Breadth First Traversal on a graph is?
(A) Stack (B) Array (C) Queue (D) Tree

38. In linked list each node contains a minimum of two fields. One field is data field to store the data, second field is?
(A) Pointer to character (B) Pointer to integer
(C) Pointer to node (D) Node

39. Which of the following traversing algorithm is not used to traverse in a tree?
(A) Post order (B) Pre order (C) Randomized (D) None of these

40. Which of the following statement(s) about stack data structure is NOT correct?
(A) Linked List are used for implementing Stacks
(B) Top of the Stack always contain the new node
(C) Stack is the FIFO data structure
(D) Null link is present in the last node at the bottom of the stack

41. A subset of a network that includes all the routers but contains no loops is called _____
(A) spanning tree (B) spider structure (C) spider tree (D) special tree

42. An endpoint of an inter-process communication flow across a computer network is called _____
(A) socket (B) pipe (C) port (D) machine

43. The values GET, POST, HEAD etc are specified in _____ of HTTP message
(A) Request line (B) Header line (C) Status line (D) Entity body

44. In a network, If P is the only packet being transmitted and there was no earlier transmission, which of the following delays could be zero?
(A) Propagation delay (B) Queuing delay
(C) Transmission delay (D) Processing delay

45. _____ is the data mining functionality that identifies data objects that don't comply with the general model or behaviour of the available data:
(A) Evolution analysis (B) Outlier analysis
(C) Classification (D) Prediction

46. Which modulation scheme is used by Bluetooth?
(A) GFSK (B) DQPSK (C) BPSK (D) MSK

47. Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places?

(A) Sectoring (B) Cell splitting

(C) Micro cell zone concept (D) Scattering

48. Which of the following is a type of cloud computing service?

(A) Service-as-a-Software (SaaS) (B) Software-and-a-Server (SaaS)

(C) Software-as-a-Service (SaaS) (D) Software-as-a-Server (SaaS)

49. Which of the following is used to capture data from the physical world in IoT devices?

(A) Sensors (B) Actuators (C) Microprocessors (D) Microcontrollers

50. Which of the following statement describe the term pixel depth?

(A) It is the number of units used to represent each pixel in RGB space

(B) It is the number of mm used to represent each pixel in RGB space

(C) It is the number of bytes used to represent each pixel in RGB space

(D) It is the number of bits used to represent each pixel in RGB space

x-x-x

ROUGH WORK

Mechanical Engineering(Ph.D.)

1. In which of the following scales of measurements ranking of observations is not possible

(A) Nominal (B) Ordinal (C) Interval (D) Ratio

2. A sampling technique in which units are randomly sampled from a population that has been divided into categories is called

(A) Simple random sampling (B) Stratified random sampling
(C) Cluster random sampling (D) Systemic random sampling

3. The degree to which observed values/scores are free from errors of measurement, refers to

(A) Content validity (B) Construct validity
(C) Criterion validity (D) Reliability

4. In which of the following research methods, manipulation and control of variables, and randomization of sample are two of the basic requirements

(A) Ex-post facto research (B) Descriptive research
(C) Experimental research (D) Case study research

5. In which of the following research methods, process of hypothesis testing optimally safeguards the role of extraneous variables

(A) Ex-post facto method (B) Experimental method
(C) Historical method (D) Descriptive survey method

6. Plagiarism in research is

(A) Creative use of previous data
(B) Copying unscrupulously and using
(C) Quoting someone and citing him/her
(D) Referring to previous data and working over it with new objectives

7. The ethical considerations in research include

(a) Free copying from books and journals
(b) Informed consent
(c) Avoiding plagiarism
(d) Proper referencing
(e) Privacy as an insignificant issue

Choose the correct answer from the options given below:

(A) (a), (b), (c) only (B) (b), (c), (d) only
(C) (c), (d), (e) only (D) (a),(d), (e) only

8. In the context of hypothesis testing using paired t-test, if N is the number of pairs in the two related samples, the degree of freedom is

(A) 2N-1 (B) 2N-2 (C) N-1 (D) N

9. The objective of exploring the existing literature should be to identify which of following issues?

a. What is already known about this area?
b. What concepts and theories are relevant in this area?
c. How to get funding for the research?
d. What are the significant controversies in this area?
e. Are there any inconsistencies in the finding of this area?

Choose correct answer from the options below:

(A) a, b, c & d only (B) b, c, d & e only
(C) a, b, d & e only (D) a, b, c & e only

10. Hypothesis testing is the main concept of which type of research?

(A) Experimental research (B) Historical research
(C) Survey research (D) Exegetic research

11. If a researcher has to test a hypothesis whether the difference between the means of two groups is significant, she/he will use

(A) Chi-square test (B) Correlation coefficient
(C) Sign-test (D) Student's t-test

12. A researcher wants the research question to be

(A) Secretive (B) Implicit (C) Explicit (D) Ambiguous

13. When knowledge becomes replicable and verifiable, it is called

(A) Humanistic (B) Impressionistic (C) Subjective (D) Scientific

14. External validity in research refers to

(A) The rigour of the study
(B) The accuracy of a procedure
(C) The relation of the research problem with the researcher's personal life
(D) The extent of generalizability that the results provide

15. The study of "why does stressful living result in a heart attack?" Can be classified as

(A) Descriptive research (B) Explanatory research
(C) Correlational research (D) Feasibility research

16. The part of research paper that gives an overview of the field to be investigated and the investigator's hypotheses about the research outcome, is called

(A) Abstract (B) Introduction
(C) Results & discussion (D) Method

17. An approach to research in which the investigator creates an environment similar to one of interest in order to study behaviours in a realistic wat, refer to

(A) Simulation (B) Naturalistic observation
(C) Longitudinal research (D) Correlational research

18. A_____ variable is changed & controlled in a scientific experiment

(A) Dependent (B) Independent (C) Subjective (D) Fixed

19. The following type of research is used to recommend a final course of action:

(A) Action research (B) Basic (C) Qualitative (D) Quantitative

20. When you are searching different search engines & assessing published materials. It is a _____.

(A) Literature review (B) Literature search
(C) Internet surfing (D) Both A & B

21. What do we call data that are used for a new study but which were collected by an earlier researcher for a different set of research questions?

(A) Secondary data (B) Field notes
(C) Qualitative data (D) Primary data

22. Which of the following will produce the least sampling error?

(A) A large sample based on convenience sampling
(B) A small sample based on random sampling
(C) A large snowball sample
(D) A large sample based on random sampling

23. The measure of the extent to which responses vary from the mean is called:

(A) The mode (B) The normal distribution
(C) The standard deviation (D) The variance

24. To compare the performance of a group at time T1 and then at T2, we would use:

(A) A chi-squared test (B) One-way analysis of variance
(C) Analysis of variance (D) A paired t-test

25. To predict the value of the dependent variable for a new case based on the knowledge of one or more independent variables, we would use

(A) Regression analysis (B) Correlation analysis
(C) Kolmogorov-Smirnov test (D) One-way analysis of variance

26. For casting of turbine blades made of high temperature and high strength alloys, the most suitable process is

(A) Die casting (B) Investment casting
(C) Centrifugal casting (D) Slush casting

27. Increase in carbon content in plain carbon steels raise its

(A) ductility and UTS (B) tensile strength and malleability
(C) tensile strength and hardness (D) ductility and melting temperature

28. Solidification time of a metallic alloy casting is

(A) directly proportional to its surface area
(B) inversely proportional to the thermal diffusivity of the mould material
(C) inversely proportional to the specific heat of the cast material
(D) inversely proportional to the pouring temperature

29. A cube shaped casting solidifies in 5 minutes. The solidification time in minutes for a cube of the same material which is 8 times heavier than the original casting will be

(A) 10 (B) 20 (C) 24 (D) 40

30. Anisotropy in rolled components is caused by
(A) change in dimension (B) scale formation
(C) closure of defects (D) grain orientation

31. In a rolling process, the state of stress of the material undergoing deformation is
(A) pure compression (B) pure shear
(C) compression and shear (D) tension and shear

32. In resistance welding, heat is generated due to the resistance between
(A) electrode and work piece (B) asperities between touching plates
(C) two dissimilar metals being in contact (D) inter-atomic forces

33. The current in Amperes used in resistance spot welding of plain carbon steel sheets (1 to 3 mm thickness) lies in the range of
(A) 5000 to 50,000 Amps (B) 500 to 5000 Amps
(C) 50 to 500 Amps (D) 10 to 50 Amps

34. When the depth of cut during machining operation is increased, the specific cutting energy
(A) increases (B) decreases
(C) remains same (D) reaches an optimum value

35. During the turning of a mild steel work material, the maximum temperature is observed at
(A) primary deformation zone (B) tool and chip interface
(C) tool flank and work interface (D) machined sub-surface

36. The material most commonly used for the manufacturing of machine tool beds is
(A) low carbon steel (B) grey cast iron
(C) white cast iron (D) spring steel

37. The most common interpolation methods in continuous path NC machining are
(A) linear and circular (B) linear and parabolic
(C) circular and parabolic (D) circular and elliptic

38. A shaft of diameter $20^{+0.05/-0.15}$ and a hole of diameter $20^{+0.20/+0.10}$ mm when assembled would yield
(A) transition fit (B) interference fit
(C) clearance fit (D) none of these

39. A rod of length L and diameter D is subjected to a tensile load P. Which of the following is sufficient to calculate the resulting change in diameter?
(A) Young's modulus
(B) Shear modulus
(C) Poisson's ratio
(D) Both Young's modulus and shear modulus

40. In terms of Poisson's ratio (μ) the ratio of Young's modulus (E) and shear modulus (G) of elastic material is

(A) $2(1+\mu)$ (B) $2(1-\mu)$ (C) $\frac{1}{2}(1+\mu)$ (D) $\frac{1}{2}(1-\mu)$

41. For a simply supported beam on two end supports the Bending moment is maximum

(A) usually on the supports (B) always at mid span

(C) where there is no shear force (D) where the deflection is maximum

42. A simply supported laterally loaded beam was found to deflect more than a specified value. Which of the following measures will reduce deflection?

(A) Increase the area moment of inertia

(B) Increase the span of the beam

(C) Select a different material having lesser modulus of elasticity

(D) Magnitude of the load to be increased

43. Torque to weight ratio for a circular shaft transmitting power is directly proportional to the

(A) square root of the diameter (B) diameter

(C) square of the diameter (D) cube of the diameter

44. If the load on a ball bearing is reduced to half, the life of the ball bearing will

(A) Increase 8 times (B) Increase 4 times

(C) Increase 2 times (D) Not change

45. For full depth of involute spur gears, minimum number of teeth of pinion to avoid interference depends upon

(A) pressure angle (B) speed ratio

(C) circular path (D) pitch diameter

46. Modern gear tooth profile is given involute shape because

(A) this is a very easy curve for manufacturing

(B) sliding does not takes place anywhere on meshing teeth

(C) involute is the only profile that gives conjugate action

(D) change in the centre distance does not change gear ratio

47. A Fluid is said to be Newtonian fluid when the shear stress is

(A) directly proportional to the velocity gradient

(B) inversely proportional to the velocity gradient

(C) independent of the velocity gradient

(D) None of these

48. Naiver Stoke's equation represents the conservation of

(A) Energy (B) Mass (C) Pressure (D) Momentum

49. In shell and tube heat exchanger, baffles are mainly used to

(A) Increase the mixing of fluid (B) Increase the heat transfer area

(C) Deflect the flow in desired direction (D) Reduce fouling of the tubes surface

50. In DC welding, straight polarity (electrode negative) results in

(A) Lower penetration (B) Lower deposition rate

(C) Less heating of work piece (D) Smaller weld pool

Art History & Visual Arts (Ph.D)

1. Badami caves are located in which state.
(A) Maharashtra (B) Kerala (C) Madhya Pradesh (D) Karnataka

2. Who does Nataraja dances on
(A) Ravana (B) Kaliyuga (C) Apasmara demon (D) None of these

3. Where is the sculpture Descent of Ganges located?
(A) Kanchipuram (B) Mahabalipuram (C) Tanjore (D) None of these

4. Shaibdin is related to which school of miniature Painting.
(A) Jaipur (B) Kota (C) Malwa (D) Mewar

5. What does Dagaba denotes in Ceylonese art
(A) Stupa (B) Wall painting (C) Palace (D) None of these

6. Kotah paintings are famous for
(A) Portraits (B) Literary subject matter
(C) Palace scenes (D) Hunting scenes

7. Kalkacharya katha is related to
(A) Eastern miniature (B) Ajanta paintings
(C) Tanjore (D) Western Indian miniature paintings

8. What is Tondo painting
(A) Circular painting (B) Square painting
(C) Rectangular painting (D) None of these

9. Who said "Show me an angel and I'll paint one"
(A) Vlaminck (B) Kandinsky (C) Raphael (D) Gustave Courbet

10. Who did Apocalypse series in woodcut
(A) Albert Durer (B) Goya (C) Rembrandt (D) Vermeer

11. The painting School of Athens is painted in
(A) Stanza di Eliodoro (B) Stanza dell Incendio di Borgo
(C) Stanza della Segnatura (D) None of these

12. Pratimalakshana is part of which text
(A) Rupamandana (B) Vishnudharmottara
(C) Natyashastra (D) None of these

13. Michaelangelo learned fresco painting in the work shop of
(A) Verocchio (B) Domenico Ghirlandaio
(C) Filippo Lippi (D) Sandro Botticelli

14. Who painted Mont Sainte-Victoire

(A) Paul Gaugin (B) Matisse (C) Paul Cezzane (D) Franz Marc

15. German Expressionism was inspired from

(A) Greek Art (B) Roman Art (C) Acadamic Art (D) Primitive art

16. Who made the sculpture Endless column

(A) Brancussi (B) Barbara Hepworth (C) Matisse (D) Henry moore

17. Copper Buddha from Sultanganj is housed in which museum.

(A) Birmingham museum (B) National museum, Delhi

(C) Indian museum, Calcutta (D) None of these

18. The sculpture Parjanya and Agni, Isurumuniya Vihara is located in

(A) Cambodia (B) Java (C) Ceylon (D) Burma

19. The Maman sculpture is by which artist

(A) Louise Bourgeois (B) Jeff Koons

(C) Rodin (D) Anish Kapoor

20. The side faces in the Vaishnu Vaikuntha sculptures are of

(A) Matsya-Kurma (B) Varaha-Narsimha

(C) Varaha-Kurma (D) Matsya-Narsimha

21. Who did "Disasters of war" a series in print

(A) Durer (B) Rembrandt (C) Kirchner (D) Francesco De Goya

22. Bodhisattva Padmapani painting is in which cave at Ajanta

(A) Cave no.10 (B) Cave no.12 (C) Cave no.1 (D) Cave no.8

23. Who is the author of the book "Moving Focus"

(A) K.G. Subramanyan (B) Roda Ahluwalia

(C) Keshav Malik (D) None of these

24. Who authored the book "Dance of Shiva"

(A) Richard Bartholomew (B) Jaya Appasamy

(C) Ananda Coomaraswamy (D) None of these

25. Who is known as father of Renaissance art

(A) Duccio (B) Massacio (C) Donatello (D) Giotto

26. The degree to which observed values/scores are free from errors of measurement, refers to

(A) Reliability (B) Elemental validity

(C) Construct validity (D) None of these

27. If the research is done to find out historical developments by studying existing records and documents, is called

(A) Non observational research (B) Archival research

(C) Non participant research (D) None of these

28. Who can be a good researcher

(A) Who has MA degree (B) Who is a hard worker

(C) Who has studied research methodology (D) Who has reasoning ability

29. What is the first step of research

(A) Writing a synopsis (B) Chapterization

(C) Identifying a problem (D) To write introduction

30. A research problem is feasible only when

(A) It has relevance (B) It can be researched

(C) It adds something to knowledge (D) All of these

31. What is the importance of Bibliography

(A) It helps those who are interested in further research

(B) It has no relevance to research

(C) Shows wider knowledge of the researcher

(D) All of the above

32. Generalised conclusion on the basis of a sample is technically known as.

(A) Statistical inference (B) Parameter inference

(C) Data analysis and interpretation (D) All of these

33. Field work based research is classified as:

(A) Experimental (B) Empirical (C) Biographical (D) None of these

34. The research which is exploring new facts through the study of the past is called

(A) Mythological research (B) Historical research

(C) Philosophical research (D) None of these

35. Summarize & synthesize are characteristics of

(A) Research design (B) Story writing (C) Literature review (D) All of them

36. Participant and systematic are types of which tool of data collection

(A) Observation (B) Content analysis (C) Survey method (D) Introspection

37. Preliminary data collection is a part of

(A) Exploratory research (B) Qualitative research

(C) Explanatory research (D) Quantitative research

38. Ethics is the branch of

(A) Statistics (B) Biostatistics (C) Sociology (D) Philosophy

39. Epistemology is theory of

(A) Physics (B) Metaphysics (C) Knowledge (D) None of these

40. A researcher should do research to establish

(A) Conclusion (B) Truth (C) Information (D) All of these

41. Who authored the book "Ways of seeing"

(A) James Ferguson (B) Karl Khandalwala

(C) Richard Bartholomew (D) John Berger

42. The branch of philosophy that deals with what we see, hear, feel etc. in contrast to what may actually be real or true about the world

(A) Epistemology (B) Observation (C) Phenomenology (D) None of these

43. Research starts with the first step of

(A) Research type (B) Research ethics (C) Research problem (D) Plagiarism

44. Full form of SPSS

(A) Statistical package for the social sciences

(B) Statistical programming survey software

(C) Statistical programming Simple solutions

(D) None of the above

45. A research is a

(A) Procedure (B) Systematic and scientific enquiry

(C) Report (D) None of these

46. Appropriation of somebody else's idea, result etc. without giving them the credit is

(A) Literature review (B) Plagiarism

(C) Random ethics (D) Convenience ethics

47. The part where credit is given to any author of previous work is called

(A) Conclusions (B) Publications (C) References (D) None of these

48. Which one is not part of research methodology

(A) Drawing conclusions (B) Publication

(C) Collecting information (D) Follow up

49. Which one is not part of literature review

(A) Headings (B) Introduction (C) Recommendations (D) Conclusion

50. The Rupamandana is a treatise on

(A) Iconography (B) Painting technique (C) Dance (D) Drama

x-x-x

ROUGH WORK

English(Ph.D.)

1. The term 'Free Time' was introduced by

(A) Alan Singewood (B) Theodore Adorno (C) Stuart Hall (D) C P Snow

2. The title of an essay, a story, or a poem in a collection, as a part of a larger whole, is placed in

(A) Italics (B) Single inverted commas

(C) Quotation marks (D) None of these

3. Who is the founder of Phenomenology?

(A) Edmund Husserl (B) Edmund Burke

(C) Bertrand Russell (D) Emmanuel Kant

4. MLA (Modern Language Association) was conceived in

(A) 1185 (B) 1784 (C) 1883 (D) 1889

5. "Monadology", a literary work was authored by

(A) John Locke (B) Gottfried Wilhelm Leibniz

(C) August Comte (D) Victor Turner

6. Who among them is not an enlightenment philosopher?

(A) Soren Kierkegard (B) John Locke

(C) Thomas Hobbes (D) David Hume

7. Élan vital (roughly translated as "vital impetus" or "vital force") was coined by

(A) Henri Bergson (B) Alice Walker

(C) Homi Bhabha (D) Matthew Arnold

8. "A Cyborg Manifesto: Science, Technology, and Socialist Feminism" is authored by

(A) Richard Stallman (B) Sherry Turkle

(C) Gilles Deleuze (D) Donna J. Haraway

9. 'Theatre of the Oppressed' is a term coined by

(A) Augusto Boal (B) Marshall Mcluhan

(C) Jorge Luis Borges (D) Henri Bergson

10. Expression Theory of Art is associated with

(A) Plato (B) Aristotle (C) Cicero (D) Socrates

11. In which essay of bacon the statement, "when dislike prevails against the government, good actions and bad offend alike" is written?

(A) Of Seditions and Troubles (B) Of Atheism

(C) Of Empire (D) Of Discourse

12. Who first translated derrida's of grammatology into English?

(A) Aijaz Ahmed (B) Edward Said

(C) Gayatri C. Spivak (D) Homi Bhabha

13. 'On Reading Old Books' is authored by

(A) William Shakespeare (B) William James

(C) William Wordsworth (D) William Hazlitt

14. The collection and study of proverbs is called

(A) Paralogy (B) Palillogy (C) Paremiology (D) Pyroballogy

15. Who is the author of the banned book "Ramayana: A True Reading"?

(A) Girish Karnad (B) Periyar E V Ramasamy

(C) Sudhir Kakkar (D) Rabindra Nath Tagore

16. Which one can be best described as Raymond William's contribution to Marxist Criticism?

(A) Base and Structure (B) Cultural Materialism

(C) Superstructure (D) Historical Materialism

17. The newly coined lexical units or existing lexical units that acquire new sense in a language are called as:

(A) Collocations (B) Eponyms (C) Neologisms (D) Cultural Terms

18. The title of Cleanth Brook's book 'The Well-Wrought Urn: studies in the structure of poetry' alludes to the poem

(A) Rime of Ancient Mariner (B) The Canonization

(C) To His Coy Mistress (D) Ode To The West Wind

19. Queer Theory 1991 was proposed by

(A) Teresa de Lauretic (B) Charles Fourier

(C) Kingsley Amis (D) Irving Wardle

20. 'School of Resentment' is associated with

(A) Harold Bloom (B) Salman Rushdie (C) Gertrude Stein (D) George Orwell

21. CDA stands for

(A) Content discourse analysis (B) Concept discourse analysis

(C) Critical discourse analysis (D) Course discourse analysis

22. C. L. R. James' work "Beyond a Boundary" focuses on

(A) Cricket Commentary (B) Postmodernist Theory

(C) Partition Poetry (D) None of these

23. *Poisoned Bread,* an anthology was edited by

(A) Arjun Dangle (B) Namdeo Dhasal

(C) Sharan Kumar Limbale (D) Meena Kandasamy

24. The 2011 play *Desdemona* arose from a collaboration between

(A) Toni Morrison, Peter Sellars, and Rokia Traore

(B) Paula Vogel, Ben Okri, and Roshni Mooneeram

(C) Amitav Ghosh, Ania Loomba and Martin Orkin

(D) Oshima, Alice and Ann Hogue

25. "Notes on Nationalism", is a work by

(A) Mahatma Gandhi (B) George Orwell

(C) Rabindra Nath Tagore (D) Franz Fanon

26. Coexistence of many possible meanings for a word or phrase is

(A) Synonymy (B) Polyphony (C) Polysemy (D) Polygamy

27. Borges' narrator in *The Library of Babel* describes how his universe consists of an enormous expanse of adjacent _____rooms.

(A) Pentagonal (B) Hexagonal (C) Octagonal (D) Rectangular

28. *Panopticism* is a social theory named after Panopticon, originally developed by

(A) Jean Baudrillard (B) Michel Foucault (C) Terence Hawkes (D) Eric Hobsbawm

29. *Jai Bhim Comrade* is a documentary film directed by

(A) Anand Patwardhan (B) Jabbar Patel (C) Shekhar Kapoor (D) Nagaraj Manjule

30. Who among the below mentioned critics is known for 'Dialogic Criticism'?

(A) R. Jacobson (B) V. Propp (C) M. Bakhtin (D) Eichenbaum

31. In Dryden's essay of Dramatic Poesy there are four interlocuters representing four different ideologies. Which of them expresses Dryden's own views?

(A) Lisideius (B) Euginius (C) Neander (D) Crites

32. What does the term meta-language means, according to Andrej Warminski

(A) A language about another language

(B) A supernatural language

(C) A language that does not yet constitute a real language

(D) All of the above answers are correct

33. Which school of literary theory shows a particular interest in the role of testimony in literature?

(A) Trauma theory (B) Eco theory (C) Chaos theory (D) Formalism

34. Who remarked, "Spenser write no language."?

(A) Alexander Pope (B) Matthew Arnold

(C) Dr Samuel Johnson (D) Ben Jonson

35. Who considers poetry 'a mother of lies'?

(A) Aristotle (B) Plato (C) Stephen Gosson (D) Alexander Pope

36. Aristotle and Plato belong to which phase of criticism?

(A) Hellenic (B) Hellenistic (C) Renaissance (D) Graeco-Roman

37. Which text argues that, as infants, human beings begin to define their identities against the identities of others?

(A) Judith Butler's Gender Trouble (B) W.E.B. Du Bois's The Souls' of Black Folk

(C) Roland Barthes's The Death of the Author (D) Jacques Lacan's The Mirror Stage

38. What is double consciousness……?

(A) An early aspect of ethnic criticism

(B) An understanding how double experience create identity

(C) A concept developed by W.E.B. Du Bois

(D) All of the above answers are correct

39. Which of the following is not a type of research question?

(A) A hypothesis (B) Predicting an outcome

(C) Evaluating a phenomenon (D) Developing a good practice

40. Which school of theorists is most closely associated with phenomenology?

(A) The Moscow School (B) The Chicago School

(C) The Frankfurt School (D) The Geneva School

41. Which of the following texts provide the best example of *defamiliarization*?

(A) Aristote's *Poetics* (B) Leo Tolstoys *The Kreutzer Sonata*

(C) Joseph Conrad's *Heart of Darkness* (D) Charlotte Bronte's *Jane Eyre*

42. Who said, 'theatre is not a hospital'?

(A) F. L. Lucas (B) J K Atkins (C) Jacques Derrida (D) Hillis Miller

43. Which literary theory would most directly explore questions of the role of spatial setting in a poem?

(A) Trauma theory (B) Eco theory (C) Game Theory (D) Marxist Theory

44. With which theorist is the concept imaginative geography associated?

(A) Julia Kristeva (B) Frederic Jameson (C) Terry Eagleton (D) Edward Said

45. The following is not a collection of poems by Sarojini Naidu:

(A) The Interior Landscape (B) The Broken Wing

(C) The Golden Threshold (D) The Bird of Time

46. Which among the below listed essays is that one of the early essays written by James Stratton Holmes in which he argues that Translation Studies is a discipline on it's own right:

(A) "The Name and Nature of Translation Studies"

(B) "Translation as Rewriting"

(C) "The Nature and Role of Norms in Translation"

(D) "The Position of Translated Literature within the Literary Polysystem"

47. The collection of stories about the different lives of Buddha

(A) Netti Prakarna (B) Budha Charita (C) Harsh Charita (D) Jataka Katha

48. A…… is a combination of words in a language that happens very often and more frequently than would happen by chance":

(A) Compound word (B) Collocation (C) Onomatopoeia (D) Phrasal Word

49. *Aadan pradan* is a project of

(A) Sahitya Akademi (B) Central Institute of Indian Languages

(C) Central Institute of Hindi (D) National Book Trust

50. The term gobbledygook meaning unintelligible nonsense was coined by

(A) Maury Maverick (B) Tejaswini Niranjana

(C) W. V. O. Quine (D) Imal Ricouer

x-x-x

ROUGH WORK

Vocal & Instrumental(Ph.D.)

1. Term BANI stands for:
(A) Rag (B) Taal (C) Bandish (D) Gharana

2. Founder of Etawah Gharana:
(A) Inayat Khan (B) Imrat Khan (C) Imdad Khan (D) Irshad Khan

3. Auther of Srimallakyasangeetam:
(A) Pt. Onkar Nath (B) Pt. Bhatkhande
(C) Pt. Sharang Dev (D) Pt. Ratanjankar

4. Name the Guru of Ustad Ali Akbar Khan:
(A) Ust. Alladiya Khan (B) Ust. Allauddin Khan
(C) Ust. Imdad Khan (D) Ust. Ishrat Khan

5. Meaning of Research is:
(A) Bibliography (B) Synopsis (C) Research Proposal (D) Anusandhan

6. Swar Sangati of Rag Deshkar is:
(A) Sa - Ma (B) Sa - Pa (C) Sa – Dha (D) Sa – Ga

7. Distance of Shruti of Shadaj – Madhyam Samvad is:
(A) 9 (B) 11 (C) 13 (D) 15

8. What is not the Part of Khayal Shailli?
(A) Aalap (B) Taan (C) Upaj (D) Sargam

9. Vande-Mataram is based on Rag:
(A) Khamaj (B) Jhinjhoti (C) Jai Jaiwanti (D) Des

10. Name the pen name of Ustad Bade Ghulam Ali:
(A) Premrang (B) Sabrang (C) Nehrang (D) Dilrang

11. Name the Taal having 10 Matras:
(A) Teevra (B) Sultal (C) Adachartal (D) Deepchandi

12. Name the Taal having 16 matras used in thumri:
(A) Dhumali (B) Deepchandi (C) Tilwada (D) Jat Taal

13. Rag Vigyan was written by:
(A) Pt. Bhatkhande (B) Pt. Ramashrey Jha
(C) Pt. V.R. Patwardhan (D) Pt. Ahobal

14. Whose Pen Name is Prem Das:
(A) Ust. Natthan Khan (B) Ust. Latafat H. Khan
(C) Ust. Imdad Khan (D) Ust. Fayyiyaz Khan

15. Information about books consulted during research mentions in the thesis under the head of:
(A) Index (B) Appendix (C) Bibliography (D) Conclusion

16. Pt. Kelucharan Mahapatra is known for Dance form:

(A) Katthak (B) Kuchipudi (C) Odissi (D) Bharatnatyam

17. First string of Tanpura is tuned in Raag Puriya:

(A) Pa (B) Ma (C) Dha (D) Ni

18. Which Raag not sung in the evening?

(A) Puriya (B) Marwa (C) Sohni (D) Poorvi

19. Name the Taal used in Dhamaar Shailly?

(A) Chartaal (B) Sultaal (C) Dhamar (D) Teevra

20. Abhinav Geetanjali is written by:

(A) Pt. Bhatkhande (B) Pt. Ramashrey Jha

(C) Pt. Onkar Nath Thakur (D) Pt. Ranadey

21. Strings are used in sitar of Senia Gharanaare:

(A) 16 (B) 17 (C) 18 (D) 19

22. Pt. Ratnakar Pai belongs to gharana:

(A) Jaipur (B) Agra (C) Kirana (D) Patiala

23. Taals of 7 beats used in classical music are:

(A) 2 (B) 3 (C) 4 (D) 5

24. Which of the following Raag is a type of Bhairavi Thaat?

(A) Malkauns (B) Chandrakauns (C) Kedar (D) Hameer

25. Which is the part of Research?

(A) Footnotes (B) Mixing (C) Editing (D) Anchoring

26. Pt. Nikhil Banerjee is famous for?

(A) Sitar (B) Sarod (C) Violin (D) Flute

27. Name of Guru of Pt. Jagannath Bua Purohit is:

(A) Ust. Vilayat Khan (B) Ust. Vilayat Hussain Khan

(C) Pt. Ratanjankar (D) Pt. Ravi Shamkar

28. Author of 'Naghmat- E- AAsafi':

(A) Ghulam Rasool (B) Mohammad Raza

(C) Iliyas Khan (D) M. Siddiqui

29. Which is known as aprachlit Rag?

(A) Ahir Bhairav (B) Lalit (C) Pancham (D) Suha

30. Which Taal has SAM on Khali?

(A) Rudra (B) Rupak (C) Sultaal (D) Teevra

31. Gharana of Vidushi Kesarbai Kerkar is:

(A) Agra (B) Jaipur (C) Kirana (D) Patiala

32. Pt. Siya Ram Tiwari was known for:

(A) Khayal (B) Thumri (C) Dhrupad (D) Bhajan

33. Who is famous for Thumri singing?

(A) Vid. Savita Devi (B) Vid. Nirupama Rai

(C) Vid. Monghu Bai (D) Vid. Sitara Devi

34. PEN NAME of Ustad Bade Ghulam Ali Khan:

(A) Premrang (B) Nehrang (C) Sabrang (D) Dilrang

35. Which is not a part of Research?

(A) Data collection (B) Synopsis (C) Composing (D) Footnotes

36. Name the Guru of Pt. Ravi Shankar:

(A) Alladiya Khan (B) Allauddin Khan

(C) Allabande Khan (D) Allarakkha Khan

37. Ada Chartal starts with the Bol:

(A) Dha (B) Dhin (C) Ti (D) Ka

38. Name the granth written by Matang:

(A) Sangeet Ratnakar (B) Natyashastra (C) Sangeet Sar (D) Brihaddeshi

39. Pt. Ronu Majumdar is known for:

(A) Flute (B) Tabla (C) Violin (D) Sarod

40. Name the14 matra Taal having two matras in each vibhag:

(A) Deeapchandi (B) Jhumra (C) Adachartaal (D) Dhamar

41. Which sangati is not being used in Rag Bhatiyar?

(A) Sa-Dha (B) Sa-Ma (C) Pa-Ga (D) Re-Ma

42. Which pair of raag has similar swaras?

(A) Kedar- Hameer (B) Bageshree - Rageshree

(C) Puriya Kalyan – Puriya Dhanashree (D) Megh – Madhumad Sarang

43. Which rag of Basant season?

(A) Bairagi (B) Bahar (C) Bhatiyar (D) Bihag

44. A female famous Kathak Dancer:

(A) Sonal Mansingh (B) Protima Bedi

(C) Meenakshi Sheshadri (D) Kajal Sharma

45. Name the famous Sitarist:

(A) Jaya Biswas (B) Kala Ramnathan

(C) Sharan Rani (D) Zareen Daruwala

46. SA DHA DHA PA, GA PA DHA PA , ga……ReSa……indicates which Raag?

(A) Bhairav (B) Deshkar (C) Kalawati (D) Bilawal

47. Which is related to Research:

(A) Appendix (B) Notation (C) Sthayi (D) Aesthetics

48. Swarmelkalanidhi was written by

(A) Shree Nivas (B) Vyankatmakhi (C) Ahobal (D) Ramamatyab

49. How many swaras are used in Raag Gunkali:

(A) 5 (B) 6 (C) 7 (D) 8

50. Name the Raag with Two Nishad:

(A) Jog (B) Tilang (C) Basant (D) Kalingda

x-x-x

Faculty of Pharmaceutical Sciences

1. Which of the following antibiotics is not given orally?
(A) Gentamicin (B) Amoxicillin (C) Ciprofloxacin (D) Cotrimoxazole

2. Which sterilization technique is used for sterilization of surgical dressings?
(A) Dry heat sterilization (B) Moist heat sterilization
(C) Radiation sterilization (D) Gaseous sterilization

3. Factor XII is
(A) Stuart factor (B) Stable factor (C) Christmas factor (D) Hageman factor

4. Anticancer agent that acts by inhibition of topoisomerase is
(A) Doxorubicin (B) Methotrexate (C) Busulfan (D) Etoposide

5. Active transport of acetylcholine into synaptic vesicles is blocked by
(A) Hemicholinium (B) Botulinum toxin
(C) Vesamicol (D) Black widow spider toxin

6. The moisture content of a drug is determined by which of the following
(A) Karl Fischer Method (B) Spray drying
(C) HPLC (D) Distillation

7. Sodium nitrate is used in which poisoning
(A) Cyanide (B) Heavy metal poisoning
(C) Barbiturates (D) Alkaloidal poisoning

8. Boric acid is freely soluble in
(A) Alcohol (B) Water (C) Glycerine (D) Chloroform

9. FAD and FMN are co-enzymes form of
(A) Riboflavin (B) Thiamine (C) Ascorbic acid (D) Niacin

10. The limits of sieve numbers for coarse powder
(A) No. 10/44 (B) No. 22/65 (C) No. 44/85 (D) No. 120

11. Hermetically sealed containers are used for
(A) Galenicals (B) Tablets (C) Aerosols (D) Injectables

12. Which of these is not used as a preservative in parenterals:
(A) Benzyl alcohol (B) EDTA (C) Chlorbutanol (D) Parabens

13. Which test is the part of the parametric test?
(A) Sign Test (B) Run Test for Randomness
(C) Kruskal-Willis Test (D) z-test

14. When a drug binds to a silent receptor,
(A) No pharmacological response occurs
(B) The drug gets metabolized
(C) Neuroendocrine hormones get released
(D) DNA changes occur

15. Youngs formula is used to calculate
(A) Body surface area (B) Body mass index
(C) Individual child dose (D) Weight height ratio

16. Nicotinic receptors are found in
(A) Skeletal muscles (B) Smooth muscles
(C) Heart (D) Exocrine glands

17. Loan licences can be granted only for drugs other than those specified in
(A) Schedule X drugs (B) Schedule C drugs
(C) Schedule C & `C(1)` drugs (D) ScheduleZdrugs

18. Example for a tablet disintegrants
(A) Lactose (B) Acacia (C) Primogel (D) Talc

19. Random sampling is also called _____.
(A) Availability sampling (B) Probation sampling
(C) Probability sampling (D) Prospect sampling

20. Which one will show nonlinear pharmocokinectics?
(A) Phenytoin (B) Lithium (C) Quinidine (D) Carbamazepine

21. Which of the following is not a hot extraction technique.
(A) Infusion (B) Sohxlet extraction (C) Maceration (D) Reflux

22. A patient brings in a vial of cloudy regular insulin. Examination of the medication profile reveals simultaneous use of NPH and regular insulin. Which of the following is the MOST PROBABLE explanation for the cloudy appearance?
(A) The insulin has been improperly stored (B) The insulin has expired
(C) The insulin has been contaminated (D) The insulin is expected to be cloudy

23. Tragacanth is used as a ..... in emulsion
(A) Solvent (B) Solute (C) Auxillary Emulsifier (D) Colorant

24. In the prescription, the abbreviation S.O.S. indicates
(A) Before meals (B) Need only (C) After meals (D) Suppository

25. Creaming in emulsions is due to:
(A) Difference in density of two phases (B) Coalescence of particles
(C) Change in volume (D) Both A and B

26. Which of the following drugs has an inotropic effect
(A) Amphetamine (B) Amphotericin (C) Amrinone (D) Allopurinol

27. The appearance of crystals in mannitol injection indicate that the product:
(A) Exposed to cold (B) Settled while shipping
(C) Contains impurities (D) Formulated using sterile saline

28. Which one of the following drugs is to be avoided in diarrhea
(A) Beta receptor blocker (B) Alpha receptor blocker
(C) 1-12 receptor antagonist (D) Muscarinic receptor antagonist

29. Patient taking MAO inhibitors are advised NOT to take along with drug

(A) Caffeine (B) Cabbage (C) Coumarin (D) Cheese

30. Which of the following is not a laxative

(A) Liquid paraffin (B) Glycerol

(C) Psyllium husk (D) Aluminium hydroxide

31. Talc, Calamine, Grieseofulvin are the examples of

(A) Diffusible solids (B) Complexing agents

(C) Indiffusible solids (D) Flocculating agents

32. Liniment is applied to skin

(A) With friction (B) Without friction (C) Both A & B (D) None of these

33. Which one of the following is NOT a tabletting defect?

(A) Orange peel effect (B) Blistering

(C) Molting (D) Flocculation

34. Calamine lotion I.P

(A) Zinc oxide and ferric oxide (B) Basic zinc carbonate

(C) Zinc carbonate with ferric oxide (D) Calcium oxide with ferric oxide

35. Which one of the following is NOT true?

(A) Modified release formulations are most useful for drugs with a long half-life

(B) Modified release formulations can often reduce side-effects

(C) Modified release formulations can improve patient compliance

(D) Modified release formulation can be used for local drug delivery

36. Which of the following is a weekly acidic drug?

(A) Ephedrine hydrochloride (B) Phenytoin sodium

(C) Atropine sulphate (D) Chloroquine phosphate

37. Genetic information of nuclear DNA is transmitted to the site of protein synthesis by

(A) TRNA (B) mRNA (C) IRNA (D) Proteosomes

38. A toothpaste contains stannous fluoride and calcium pyrophosphate along with other formulation constituents. Choose the correct statement out of the following

(A) stannous fluoride is an anticaries agent while calcium pyrophosphate is a dentifrice

(B) stannous fluoride is dentifrice while calcium pyrophosphate is a desensitizing agent

(C) stannous fluoride is desentizing agent while calcium pyrophosphate is anticaries agent

(D) both are dentrifices while calcium pyrophosphate is additionally a desensitizing agent

39. T.I.D is abbreviated for

(A) Bis in die (B) Ter in die (C) Desserspoonful (D) Tablespoonful

40. Aurio dextra means which one of the following?

(A) left ear (B) take immediately (C) right ear (D) take as directed

41. A drug whose solubility is 1 g/L in water, when given orally at a dose of 500mg is absorbed upto 95% of the administered dose. The drug belongs to which class of BCS classification.

(A) Class I (B) Class II (C) Class III (D) Class IV

42. Which of the following is not an indole alkaloids:

(A) Physostigmine (B) Vinblastine (C) Reserpine (D) Berberine

43. Which of the following is not a hot extraction technique?

(A) Reflux (B) Maceration (C) Infusion (D) Soxhlet

44. Ligand, matrix and spacer arm are important components of which chromatographic technique:

(A) Gel chromatography (B) Electrophoresis

(C) Affinity chromatography (D) Ion-exchange chromatography

45. Thalleoquin test is performed for the detection of:

(A) Reserpine (B) Rescinnamine (C) Ajmaline (D) Quinine

46. Which of the following two rings can be traced in a tropane nucleus?

(A) Pyridine and pyrrolidine (B) Pyrrole and piperidine

(C) Pyridine and piperidine (D) Pyrrolidine and piperidine

47. Ephedrine belongs to a class of:

(A) Typical alkaloids (B) Atypical alkaloids

(C) Pseudoalkaloids (D) Coloured alkaloids

48. Keller-Kiliani test is used to detect the presence of:

(A) Aglycone part of digitalis glycosides (B) Glycone part of digitalis glycosides

(C) Digitoxigenin (D) Lactone ring of digitoxigenin

49. The main objective of …….. study is to acquire knowledge

(A) Exploratory (B) Descriptive

(C) Diagnostic (D) Descriptive and Diagnostic

50. Research is

(A) Searching again and again

(B) Finding solution to any problem

(C) Working in a scientific way to search for truth of any problem

(D) None of the above

x-x-x

ROUGH WORK

Anthropology (Ph.D.)

1. "*A branch of study which is concerned either with a connected body of demonstrated truths or with observed facts systematically classified and more or less colligated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain*"

(A) Scientific method (B) Science

(C) Research technique (D) Research method

2. When general conclusions are used to arrive at particular conclusions it is known as _____.

(A) Analysis (B) Inductive method

(C) Deductive method (D) Conceptualisation

3. A research method is _____.

(A) cyclical (B) expanding (C) contracting (D) repetitive

4. _____is a short hand representation of a variety of facts.

(A) Theory (B) Fact (C) Variable (D) Concept

5. When concepts are mapped on to a set of values we get _____.

(A) Graph (B) Data (C) Facts (D) Variables

6. The variables that a researcher wishes to explain are _____variables.

(A) Control (B) Explanatory (C) Criterion (D) Predictor

7. _____ is an empirically verifiable observation.

(A) Hypothesis (B) Fact (C) Theory (D) Observation

8. _____ is a relationship between facts.

(A) Theory (B) Hypothesis (C) Fact (D) Analysis

9. When facts are assembled, ordered, and seen in a relationship, they constitute a _____.

(A) Theory (B) Hypothesis (C) Fact (D) Analysis

10. A _____ is a defined size of population on which the study is to be performed.

(A) Sample (B) Universe (C) Unit of study (D) Pilot

11. A smooth curve connecting the top mid points of the bars of a histogram is called a

(A) Bar diagram (B) Frequency curve

(C) Frequency polygon (D) Cumulative frequency curve

12. Ogives refer to

(A) Pie-diagrams (B) Bar diagrams

(C) Frequency curve (D) Cumulative frequency curve

13. Which is the nearest to the objectives of statistics?

(A) Solve mathematical problems (B) Create confusion with data

(C) Make inferences (D) Take measurements

14. The coefficient of Variation is a ratio involving

(A) Mean and variance (B) Mean and standard deviation

(C) Mean and mode (D) Mean and median

15. The first moment about the mean is equal to

(A) 0 (B) 1 (C) Variance (D) Standard deviation

16. Bibliography given in a research report:

(A) Shows the vast knowledge of the researcher

(B) Helps those interested in further research

(C) Has no relevance to research

(D) All of the above

17. The study in which the investigators attempt to trace an effect is known as:

(A) Survey research (B) 'ex-post facto' research

(C) Historical research (D) Summative research

18. Generalised conclusion on the basis of a sample is technically known as:

(A) Data analysis and interpretation (B) Parameter inference

(C) Statistical inference (D) All of the above

19. The experimental study is based on:

(A) The manipulation of variables (B) Conceptual parameters

(C) Replication of research (D) Survey of literature

20. Which technique is generally followed when the population is finite?

(A) Area Sampling Technique (B) Purposive Sampling Technique

(C) Systematic Sampling Technique (D) All of the above

21. Formulation of hypothesis may NOT be required in:

(A) Survey method (B) Historical studies

(C) Experimental studies (D) Normative studies

22. Field-work based research is classified as:

(A) Empirical (B) Historical (C) Experimental (D) Biographical

23. A research that applies laws at the time of field study to draw more and more clear ideas about the problem is:

(A) Applied research (B) Action research

(C) Experimental research (D) None of the above

24. When a research problem is related to a heterogenous population, the most suitable sampling method is:

(A) Cluster sampling (B) Stratified sampling

(C) Convenient sampling (D) Lottery Method

25. Action research is:
(A) An applied research
(B) A research carried out to solve immediate problems
(C) A longitudinal research
(D) All of the above

26. Who among the following has worked on the 'tribe-caste continuum'?
(A) T.C. Das (B) R. Redfield (C) S. Sinha (D) V. Elwin

27. Which one of the following processes is considered equivalent to socialization in Anthropology?
(A) Enculturation (B) Acculturation (C) Assimilation (D) Mobilization

28. Who among the following is a proponent of Cultural Ecology?
(A) Daryll Forde (B) Ralph Linton (C) Julian Steward (D) Clifford Geertz

29. One can judge the level of a culture by "the amount of energy harnessed and put … to use per capita per year by the group." This is a statement that was proposed by:
(A) Leslie White (B) Abram Kardiner (C) V.G. Childe (D) Cora Du-Bois

30. Psychic unity of mankind is associated with the school of:
(A) Diffusionism (B) Evolutionism
(C) Neo-evolutionism (D) Culture and Personality

31. Match it:

	List I	**List II**
(a)	The Raw and the Cooked	(i) W.J. Perry
(b)	The Children of the Sun	(ii) Claude Levi-Strauss
(c)	A Tribe in Transition	(iii) D.N. Majumdar
(d)	Ancient Society	(iv) L.H. Morgan

Codes:

	(a)	(b)	(c)	(d)
(A)	(ii)	(i)	(iv)	(iii)
(B)	(i)	(ii)	(iii)	(iv)
(C)	(iv)	(iii)	(i)	(ii)
(D)	(ii)	(i)	(iii)	(iv)

32. Consider the following statements and find the correct ones:
1. PVTGs are abbreviated from Particularly Vulnerable Tribal Groups
2. PVTGs are found in 18 states and one UT of India
3. Odisha state is having the highest number of PVTGs

(A) 1 Only (B) 1 and 2 (C) 2 and 3 (D) All of these

33. As per 2011 census the total population of Scheduled Tribes in India is (in %):
(A) 8.2 (B) 8.5 (C) 8.6 (D) 8.7

34. Which of the following were correct about the Kalelkar Commission:

(A) It was the first Backward Classes Commission

(B) It was set up in 1958 under the Chairmanship of Kaka Kalelkar

(C) One of the Commission's recommendations was treating all men and women as a class as 'backward'

(D) All of the above

35. Which school is known as 'Moderate Diffusionism'?

(A) American Diffusion School (B) German Diffusion School

(C) British Diffusion School (D) Neo-Evolutionism

36. The cranial capacity of Australopithecus africanus is:

(A) 780 cc (B) 630 cc (C) 680 cc (D) 520 cc

37. Who among the following is the contemporary of Homo habilis?

(A) Paranthropusrobustus (B) Australopithecus premotheus

(C) Zinjanthropusboisei (D) Telanthropuscapaensis

38. Match the following:

1. South Africa	a. *Homo habilis*
2. East Africa	b. *Paranthropuscrassidens*
3. Palestine	c. *Meganthropusrateojavanicus*
4. Java	d. *Australopithecus*

Code:

	1	2	3	4
(A)	a	b	c	d
(B)	b	c	a	d
(C)	d	b	a	c
(D)	b	a	d	c

39. Which one of the following materials is suitable for Potassium-argon dating?

(A) Varves (B) Parchment (C) Tree ring (D) Biotite

40. Which of the following are Lower Palaeolithic sites from India?

(i) Chirand (ii) Chauntra (iii) Didwana (iv) Vadamadurai

Code:

(A) (ii), (iii) and (iv) are correct

(B) (i), (iii) and (iv) are correct

(C) (i), (ii) and (iii) are correct

(D) (i) and (iii) are correct

41. Match it:

List-I	**List-II**
(i) Cultural Resource Management	a. GIS
(ii) Thermoluminescence dating	b. Tell
(iii) Large mound formed due to successive occupation	c. TL
(iv) Geographical Information	d. CRM

Codes:

	(a)	(b)	(c)	(d)
(A)	(iii)	(iv)	(i)	(ii)
(B)	(ii)	(i)	(iii)	(iv)
(C)	(i)	(ii)	(iv)	(iii)
(D)	(iv)	(iii)	(ii)	(i)

42. Match it:

List-I	**List-II**
(i) Sand dune	a. Mahadaha
(ii) Coastal area	b. Adamgarh
(iii) Rock Shelter	c. Langhnaj
(iv) River Valley	d. Patne

	(a)	(b)	(c)	(d)
(A)	(iv)	(iii)	(i)	(ii)
(B)	(iii)	(ii)	(iv)	(i)
(C)	(ii)	(iv)	(i)	(iii)
(D)	(i)	(ii)	(iv)	(iii)

43. Arrange in correct sequence the chronological appearance of the following stone-tool making techniques:

i. Block-on-block
ii. Punching technique
iii. Prepared core technique
iv. Cylinder hammer technique

Codes:

(A) (i), (iv), (iii), (ii)
(B) (iv), (iii), (ii), (i)
(C) (iii), (iv), (i), (ii)
(D) (ii), (i), (iii), (iv)

44. Arrange the following sites chronologically according to the culture they represent:

(i) Kalibangan
(ii) Gufkral
(iii) Bagor
(iv) Nevasa

Codes:

(A) (i), (iv), (iii), (ii)
(B) (iii), (ii), (iv), (i)
(C) (iv), (iii), (ii), (i)
(D) (ii), (i), (iii), (iv)

45. In the case of skeletalized human remains, which of the following features is not of potential use in making personal identifications?
(A) Bone disorders (B) Dentition (C) Tattoos (D) Surgical implants

46. The term used to refer to biological maximum number of births is:
(A) Sex ratio (B) Fertility (C) Fecundity (D) Natural increase

47. Biological characteristics distinguishing male from female is called:
(A) Heterosexuality (B) Gender (C) Sex (D) Homosexuality

48. The Polynesian term taboo means:
(A) Custom (B) Tradition (C) Prohibition (D) Forbidden

49. Mana is a _____ term meaning 'Power'.
(A) French (B) Melanesian (C) Greek (D) Latin

50. Gerontology is the study of the:
(A) Human beings (B) Special groups (C) Aged and aging (D) All of these

x-x-x

Bio-Physics(Ph.D.)

1. The research that is especially carried out to test and validate the study hypothesis is termed
(A) Fundamental Research (B) Exploratory Research
(C) Applied Research (D) Conclusive Research

2. Patent Cooperation Treaty (PCT) entered into force in
(A) 1978 (B) 1987 (C) 1950 (D) 1991

3. What is the major attribute of Correlation Analysis?
(A) Association among variables (B) Difference among variables
(C) Regression among variables (D) Variations among variables

4. The assumption about the expected result of the research is called the _____.
(A) Result (B) Hypothesis (C) Objective (D) Conclusion

5. Which of the following are the indices to measure quality of a research paper
(A) Impact factor (B) Journal citation indicator
(C) Source Normalized Impact per Paper (D) All of these

6. Why sign test is the parametric test?
(A) It is used when the data happen to be nominal and relate to two related samples
(B) It is based on the direction of the plus or minus signs of observations in a sample
(C) It is based on the numerical magnitudes of the samples
(D) It determines both, the direction and magnitude of difference between matched values of two related samples

7. Common laboratory hazards include
(A) Inhalation of Toxic Fumes (B) Cuts to the Skin
(C) Thermal and Chemical Burns (D) All of these

8. Which of the following is not an exact aspect of interpretation?
(A) Establishing continuity in research through linking the results
(B) Establishing explanatory concepts
(C) Reasonable explanations of the relations
(D) Generation of hypothesis

9. ISBN stands for
(A) International Social Book Number (B) Indian Standard Book Number
(C) Institutional Standard Book Number (D) International Standard Book Number

10. Which of the following is not a form of plagiarism
(A) Cutting and pasting from the Internet without clear acknowledgement
(B) Accurate citation
(C) Failure to acknowledge assistance
(D) Verbatim quotation without clear acknowledgement

11. Which one of the following is not a genuine research paper
(A) Dissertation(B) Project Report (C) Newspaper article (D) Research Article

12. Sigma Plot is a software for

(A) Drawing graph (B) Drawing bar code

(C) Drawing figures (D) Freehand drawing

13. A hypothesis is NOT _____.

(A) An informed assumption about a certain phenomenon, predicting a factor or interpreting an observation

(B) A conjecture that is grounded in support background originating from secondary research

(C) An educated claim

(D) A guess that directs the course of a research

14. The level of certainty that samples actually include the true population parameter is known as _____.

(A) Confidence interval (B) Confidence range

(C) Confidence level (D) Confidence limit

15. Analysis of variance is a statistical method of comparing the ……. Of several populations.

(A) Standard deviation (B) Variances

(C) Mean (D) Proportions

16. Parameter is

(A) A constant that describes a sample

(B) A constant that describes a population

(C) A characteristic based on which a population can be categorized

(D) A variable

17. Data structure in which all elements have similar name is called

(A) String structure (B) Positive structure

(C) Data structure (D) Array

18. According to Sturges rule, no. of classes (k) can be calculated for given observations (N) as

(A) $k = \log N$ (B) $k = 1 + 3.322 \log N$

(C) $k = 1 - 3.322 \log N$ (D) $k = 1 + \log N$

19. What is malware?

(A) A malicious software used to disrupt computer or mobile operations

(B) A code to enhance performance of the computer

(C) A company selling slip

(D) A microprocessor chip

20. Which of the following statement is True

(A) Mean is not sensitive to outliers

(B) Mode is sensitive to outliers

(C) Median is sensitive to outliers

(D) Both mode and median are not sensitive to outliers

21. Coefficient of correlation (r) is +1, which means correlation is
(A) Positive (B) Negative (C) Perfect positive (D) Perfect negative

22. Intellectual Property Right (IPR) protects the use of information and ideas that are of
(A) Ethical value (B) Monetary Value
(C) Commercial Value (D) Sentimental value

23. Median of the following data (6, 13, 9, 14, 8, 17) is
(A) 11 (B) 9 (C) 13 (D) 22

24. Rejecting the null hypothesis when it is actually true, is known as
(A) Type II error (B) Type I error
(C) Both Type I and Type II errors (D) None of these

25. Which of the following is one-way ANOVA post-hoc test when equal variances are not assumed
(A) Student-Newman-Keuls test (B) Bonferroni's test
(C) Tukey's test (D) Games-Howell test

26. The bending of a beam of light when it passes obliquely from one medium to another is known as _____.
(A) Reflection (B) Refraction (C) Dispersion (D) Deviation

27. A plant cell that is placed in an isotonic solution will _____.
(A) gain more water (B) not gain any water
(C) will lose water (D) none of these

28. Which of the following nuclei will have a magnetic moment?
(A) $^{2}D_{1}$ (B) $^{16}O_{8}$ (C) $^{12}C_{6}$ (D) $^{32}S_{16}$

29. Which type of microscope would be best to use if you wanted a 3-Dimenstional view of a bacteria cell?
(A) Compound light microscope (B) Transmission electron microscope
(C) Scanning electron microscope (D) None of these

30. Which of the following statements is always true for a reaction in which there is no non-expansion work?
(A) $\Delta U = q_p$ (B) $\Delta H = q_p$ (C) $\Delta U = 0$ (D) $\Delta H = 0$

31. Biological membranes are normally permeable to:
(A) large, hydrophilic molecules (B) small, hydrophilic molecules
(C) large, hydrophobic molecules (D) small, hydrophobic molecules

32. What is a cover slip?
(A) The cover that is placed on the jars that protects the living specimens.
(B) Glass cover that slips onto the objective lense.
(C) The small glass or plastic cover that is placed over the objects you view on a slide.
(D) The plastic cover that covers and protects scope.

33. The successive nucleotides of DNA are covalently linked through:
(A) Hydrogen bond (B) Glycosidic bond
(C) Phosphodiester bond (D) Ioinic bond

34. Which type of secondary structure is observed in the second quadrant of the Ramachandran plot:

(A) β-sheet (B) Left handed α-helix
(C) Right handed α-helix (D) Random coil

35. Separation of one protein from the other on the basis of size can be achieved by:

(A) SDS-PAGE (B) Ion-exchange chromatography
(C) Isoelectric Focusing (D) Affinity Chromatography

36. The stress response is controlled primarily by the:

(A) Kidneys (B) Adrenal glands (C) Hypothalamus (D) Thyroid gland

37. Ventricular hypertrophy will result in

(A) High Voltage electrocardiogram (B) Low Voltage electrocardiogram
(C) Isoelectric electrocardiogram (D) Decreased Heart Rate

38. Which of the following property is not related to water?

(A) High Dielectric constant
(B) Dipolar nature
(C) Bond angle 109.5°
(D) Low heat of vaporization

39. Which is the major force of attraction that stabilizes the three-dimensional structure of globular proteins.

(A) Peptide Bond (B) Van der Waal's interaction
(C) Hydrophobic interaction (D) Hydrogen bond

40. A set of microfuge tubes containing DNA, RNA and protein samples have lost their labels. Which of the following strategies will you adopt to distinguish them?

(A) Measuring absorption at 260 nm and 280 nm
(B) Measuring absorption at 240 nm, 260 nm and 280 nm
(C) Measuring absorption at 260 nm and 280 nm at 30°C and 80°C
(D) Measuring absorption at 240 nm, 260 nm and 280 nm at 30°C and 80°C

41. Which of the following pairs is inter-converted in the process of mutarotation?

(A) α-D-glucose and β-D-glucose
(B) D-glucose and C-glucose
(C) D-glucose and D-fructose
(D) α-D-glucopyranose and β-D-glucofuranose

42. dsDNA is made radioactive in both its strands. It is allowed to replicate twice in non-radioactive medium. The result would be

(A) all strands have radioactivity
(B) half of the strands have radioactivity
(C) three of the strands have radioactivity
(D) radioactivity is absent in all the cells

43. Degeneracy of genetic code implies that
(A) more than one code can code for one amino acid
(B) the codons degenerate after the synthesis of the polypeptide
(C) one code can code for more than one amino acid
(D) some codons degenerate as they are not involved in coding for any amino acid

44. The shine-dalgarno sequence is responsible for
(A) binding of RNA polymerase to gene during transcription
(B) binding of DNA polymerase to origin of replication during DNA replication
(C) binding of ribosomes to mRNA during initiation of translation
(D) binding of snurps during splicing

45. Which pair of amino acids will have the highest absorbance at 280nm?
(A) Thr and His (B) Phe and Pro (C) Trp and Tyr (D) Phe and His

46. The first bioinformatics database was created by
(A) Pearson (B) Richard Durbin (C) Michael J. Dunn (D) Dayhoff

47. If a solution of double stranded DNA is heated above its melting temperature, its absorbance will:
(A) Decrease (B) Increase
(C) Remain unchanged (D) Initially increase and then decrease

48. The melting temperature (tm) of DNA is:
(A) Directly proportional to the length of DNA
(B) Directly proportional to the GC content
(C) Not related to the base content
(D) Directly proportional to the AT content

49. The most abundant intracellular free nucleotide is:
(A) FAD^+ (B) ATP (C) NAD^+ (D) $NADP^+$

50. Glucose and mannose are epimers. This means that:
(A) They are mirror images of each other
(B) One is an aldose and the other a ketone
(C) They rotate plane polarized light in opposite directions
(D) They differ only in the configuration of one carbon atom

x-x-x

Botany(Ph.D.)

1. Who discovered electron microscopy?
(A) Ruska and Knoll (B) Mullis and Boyer
(C) Sanger and Cohn (D) Smith and Nathans

2. In Column chromatography, the stationary phase is made of_____ and the mobile phase is made of _____
(A) Solid, liquid (B) Liquid, liquid
(C) Liquid, gas (D) Solid, gas

3. Chromatogram is
(A) Solute concentration vs Elution time (B) Solute concentration vs Elution volume
(C) Both A and B (D) A only

4. Which of the following techniques would be most useful to identify as well as quantify the presence of a known impurity in a drug substance?
(A) NMR (B) LCMS/MS (C) IR (D) HPLC

5. Which of the following is a protein specific florescent dye?
(A) DAPI (B) Acridine orange
(C) Ethidium bromide (D) Rhodamine

6. Which technique is also known as colour writing?
(A) NMR (B) Mass spectroscopy
(C) Chromatography (D) PCR

7. Which of the following is a common nuclear stain?
(A) Safaranin (B) Fast Green (C) Hematoxylin (D) Erythrosine

8. The properties of integral membrane proteins can be studied by
(A) Atomic force microscopy
(B) Cryo-sectioning and electron microscopy
(C) Freeze-fracture technique and electron microscopy
(D) NMR spectroscopy

9. What is the wavelength range of the UV spectrum?
(A) 100 nm to 500 nm (B) 200 nm to 800 nm
(C) 300 nm to 1000 nm (D) 400 nm to 1600 nm

10. Which among the following is the physical method for direct transfer of genes into the cell cytoplasm without lysosomal degradation?
(A) PEG mediated (B) Dextran mediated
(C) Electroporation (D) Liposome fusion

11. Southern blotting is
(A) Attachment of probes to DNA fragments
(B) Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet
(C) Comparison of DNA fragments to two sources
(D) Transfer of DNA fragments to electrophoretic gel from cellulose membrane

12. In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under pressure?

(A) Column chromatography (B) Planar chromatography
(C) Liquid chromatography (D) Gas chromatography

13. ELISA is
(A) Using radiolabelled second antibody
(B) Usage of RBCs
(C) Using complement-mediated cell lysis
(D) Addition of substrate that is converted into a coloured end product

14. Some floral characters and their taxonomic status are shown below

Floral Characters	Taxonomic status
i) Actinomorphic	a. Advanced
ii) Elongated thalamus and cyclic whorls	b. Advanced
iii) Resupination	c. Primitive
iv) Gynobasic style	d. Primitive

(A) i-a, ii-c, iii-b, iv-d (B) i-c, ii-a, iii-b, iv-d
(C) i-b, ii-c, iii-a, iv-d (D) i-c, ii-d, iii-a, iv-b

15. Plasmids are used as cloning vectors for which of the following reasons?
(A) Can be multiplied in culture
(B) Self-replication in bacterial cells
(C) Can be multiplied in laboratories with the help of enzymes
(D) Replicate freely outside bacterial cells

16. The electron microscopy gives higher magnification than an optical microscope because
(A) The wavelength of electron used is smaller compared to that of visible light
(B) The electron microscope use more powerful lenses
(C) The velocity of electron is less than that of light
(D) The electron has more energy than light particles

17. Which bacterium is used in the production of insulin by genetic engineering?
(A) Saccharomyces (B) Rhizobium (C) Escherichia (D) Mycobacterium

18. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using
(A) Taq polymerase (B) Polymerase III (C) Ligase (D) Eco RI

19. Agarose extracted from sea weeds finds use in
(A) Spectrophotometry (B) Gel electrophoresis
(C) PCR (D) Fungal culture

20. Which of the following centrifuges works against the gravitational acceleration
(A) Conical disc centrifuge (B) Continuous horizontal centrifuge
(C) Perforated basket centrifuge (D) Semi-continuous centrifuge

21. Which of the following is (are) the application of lyophilization?
i. To process microorganisms like bacteria for storage
ii. To concentrate enzyme
iii. To process molds, protozoa, and most viruses for storage
(A) i and ii only (B) ii and iii only (C) i and iii only (D) iii only

22. Following are the processes used for extraction of plant material except
(A) Maceration (B) Sublimation (C) Digestion (D) Percolation

23. In electron microscopy, to detect specific macromolecule or structure such as spindle pole body, the frequently used procedure is to couple secondary antibody with
(A) Alexe 568 (B) Cy5 (C) Gold particle(D) Osmium tetraoxide

24. Developer of Backcross method is
(A) Johannsen (B) Jenkins (C) Flor (D) Harlan and Pope

25. Klenow fragment is derived from
(A) DNA Ligase (B) DNA Pol-I (C) DNA Pol-II (D) Reverse Transcriptase

26. Karnal bunt is caused by:
(A) *Neovossia indica* (B) *Ustilago nuda*
(C) *Puccinia graminis* (D) *Claviceps purpurea*

27. Which type of polyploidy is bread wheat?
(A) Autopolyploid (B) Allopolyploid
(C) Auto-allopolyploid (D) Segmental allopolyploid

28. Perianth is represented by small scaly lodicules in:
(A) Asteraceae (B) Apiaceae (C) Gentianaceae (D) Poaceae

29. Phycobillins are found in:
(A) Cyanophyta and Dinophyta (B) Rhodophyta and Dinophyta
(C) Rhodophyta and Cryptophyta (D) Cyanophyta and Chlorophyta

30. Which of the following is not bound by a membrane?
(A) Mitochondria (B) Peroxisome (C) Ribosome (D) Chloroplast

31. Gamma radiations are:
(A) Corpuscular (B) Non-ionizing (C) Particulate (D) Electromagnetic

32. Cycocel is the inhibitor of:
(A) Auxin translocation (B) Gibberellin biosynthesis
(C) Gibberellin translocation (D) Ethylene biosynthesis

33. The tropane alkaloids are obtained from the members of:
(A) Convolvulaceae (B) Solanaceae (C) Apocynaceae (D) Cactaceae

34. The heaviest wood is obtained from:
(A) *Hardwickia binate* (B) *Tectona grandis*
(C) *Erythrina suberosa* (D) *Krugiodendron ferrum*

35. Mutualism occurs between
(A) Butterfly and Flower (B) *Escherichia coli* and ma
(C) Zoochlorellae and Hydra (D) Hermit crab and Sea Anemone

36. Regions of roots from base to root tips are
(A) Maturation zone---Cell division zone---Elongation zone
(B) Maturation zone---Elongation zone---Cell division zone
(C) Cell division zone---Elongation zone---Maturation zone

(D) Elongation zone---Cell division zone---Maturation zone

37. Which one of these is a thermophilic algae?
(A) *Chlamydomonas nivalis* (B) *Mastigocladus laminosus*
(C) *Spirulina platensis* (D) *Oscillatoria prenceps*

38. The sex organs of hypodrmal origin are characteristics of
(A) Marchantiales(B) Metzgeriales(C) Jungermanniales (D) Anthocerotales

39. Morchella belongs to
(A) Mycomycotina(B) Deuteromycotina(C) Ascomycotina (D) Basidiomycotina

40. The fern gametophyte is known as a prothallus because
(A) It is internally differentiated (B) It is internally not differentiated
(C) It bears both the sex organs (D) It is small

41. The innermost layer of anther wall, the tapetum, attains its maximum development at
(A) Pollen grain stage (B) Tetred stage of microsporangium
(C) Dyad stage of microsporangium (D) Initial stage of microsporangium

42. Swimming spermatozoids are found in
(A) *Araucaria* (B) *Gnetum* (C) *Welwitschia* (D) *Ginkgo*

43. Nucleolus is the site of
(A) Protein synthesis (B) DNA synthesis
(C) Ribosomal assembly (D) Lipid synthesis

44. Three point test cross is used for
(A) Gene regulation (B) Gene cloning
(C) Gene mapping (D) Gene conversion

45. The geotropic response is mainly attributed to
(A) IAA and Calcium (B) ABA and IAA
(C) ABA and Calcium (D) GA_3 and Calcium

46. Which one of the following mineral elements does not appear to be structurally bound in plants
(A) Nitrogen (B) Calcium (C) Phosphorus (D) Potassium

47. The wood seasoning is a process of
(A) Cutting wood in a particular season
(B) Chemical treatment of wood
(C) Painting of wood
(D) Controlled removal of water from wood

48. The fossil *Palmoxylon* belongs to
(A) Angiosperm (B) Gymnosperms (C) Pteridophyte (D) Bryophyte

49. The production of ATP by oxidative phosphorylation is driven by energy from

(A) Co-enzyme A

(B) Isomerization of the cytochrome

(C) The formation of NADH

(D) The differentiation of protons from the intermembrane space to the matrix of the mitochondria

50. When a plant is not reproducing, most of its cytokinins are produced in its

(A) Leaves (B) Lateral buds (C) Shoot apex (D) Roots

x-x-x

ROUGH WORK

Chemistry(Ph.D.)

1. Which indicator (identified by a letter) could be used to titrate aqueous NH_3 with HCl solution?

Indicator	Acid Range Color	Color-Change pH	Basic Range Color
(A)	Pink	1.2 - 2.8	Yellow
(B)	Blue	3.4 - 4.6	Yellow
(C)	Yellow	6.5 - 7.8	Purple
(D)	Colorless	8.3 - 9.9	Red

2. Which of the following salts give acidic aqueous solutions?

(1) KNO_3 (2) KCH_3COO (3) NH_4NO_3 (4) RbI
(5) $(NH_4)_2SO_4$ (6) $BaCl_2$ (7) NaCN (8) KNO_2
(A) 2, 7, 8 (B) 3, 5 (C) 2, 4, 6 (D) 1, 4, 7, 8

3. The number 0.005436 has how many significant figures?

(A) 7 (B) 6 (C) 4 (D) 5

4. The number 10.00 has how many significant figures?
(A) 1 (B) 2 (C) 3 (D) 4

5. Guanidin, $HNC(NH_2)_2$, is a fertilizer. To three significant figures, what is the percent by mass of nitrogen in the fertilizer?
(A) 45.2% (B) 71.1% (C) 54.8% (D) 65.1%

6. A 0.500 g sample of a compound containing only antimony and oxygen was found to contain 0.418 g of antimony and 0.082 g of oxygen. What is the simplest formula for the compound?
(A) SbO (B) SbO_2 (C) Sb_3O_4 (D) Sb_2O_3

7. What is the correct sequence of events for the processes occurring in a mass spectrometer

(A) vaporization, ionization, acceleration, deflection

(B) vaporization, acceleration, ionization, deflection

(C) ionization, vaporization, acceleration, deflection

(D) ionization, vaporization, deflection, acceleration

8. In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.
Assertion: Graphite is a good conductor of electricity however diamond belongs to the category of insulators.
Reason: Graphite is soft in nature on the other hand diamond is very hard and brittle

(A) Assertion and reason both are correct statements and reason is correct explanation for assertion.

(B) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(C) Assertion is correct statement but reason is wrong statement.
(D) Assertion is wrong statement but reason is correct statement.

9. In the process of conducting research 'Formulation of Hypothesis" is followed by
(A) Statement of Objectives (B) Analysis of Data
(C) Selection of Research Tools (D) Collection of Data

10. Final stage in the Research Process is
(A) Problem formulation (B) Data collection
(C) Data Analysis (D) Report Writing

11. The research that is especially carried out to test and validate the study hypotheses is termed
(A) Fundamental research (B) Applied research
(C) Conclusive research (D) Exploratory research

12. An image, perception or concept that is capable of measurement is called_____.
(A) Scale (B) Hypothesis (C) Type (D) Variable

13. What do you understand by the term "Anusandhan"?
(A) Goal-oriented (B) Following an aim
(C) Attaining an aim (D) Praying to achieve an aim

14. The depth of any research can be judged by?
(A) By research title (B) By research duration
(C) By research objectives (D) By total expenditure on research

15. The appropriation of other person's ideas, results, words without giving appropriate credit is called
(A) Falsification (B) Plagiarism (C) Fabrication (D) Jurisdiction

16. Identify one which does not come under the Chemical methods of qualitative analysis?
(A) Gravimetric (B) Titrimetric
(C) Volumetric (D) Magnetic Susceptibility

17. Identify the test which is not a part of qualitative analysis?
(A) Litmus test (B) Castle-Meyer test
(C) Iodine test (D) Flame test

18. The constituents those present in amounts between 100 ppm (0.01%) and 1 ppb are called
(A) Major constituents (B) Minor constituents
(C) Trace constituents (D) Ultra trace constituents

19. Systematic errors can be eliminated by……..
(A) Exercizing care
(B) By calibration
(C) By the proper use of standards, blanks, and reference materials
(D) All of the above

20. In a titration, the analyte reacts with a….
(A) Standardized reagent called as titrant (B) Standardized reagents called calibrant
(C) Reactants (D) Products

21. A liquid which decomposes at its boiling point can be purified by:
(A) Distillation at atmospheric pressure (B) Distillation under reduced pressure
(C) Fractional distillation (D) Steam distillation

22. Accuracy is defined as:
(A) A measure of how often an experimental value can be repeated
(B) The closeness of a measured value to the real value
(C) The number of significant figures used in a measurement
(D) The scale of measurement

23. The difference between a molecular and structural formula is that:
(A) Molecular formulas give you the ratios of the elements in a compound, while structural formulas tell you how many atoms of each element are present.
(B) Molecular formulas tell you where the atoms in a compound are, while structural formulas don't.
(C) Molecular formulas don't tell you where the atoms in a compound are, while structural formulas do.
(D) None of the above is correct.

24. To prevent the contamination of microscopes and surrounding areas disenfect/clean used slides, prepared by student, with
(A) 70% ethanol and lens paper (B) acetone and lens paper
(C) 5% methylene blue and lens paper (D) water and lens paper

25. Carbon disulfide undergoes a single displacement reaction with oxygen to form carbon dioxide. If 100 grams of carbon dioxide are reacted with 50 grams of oxygen, what will the limiting reagent be?
(A) carbon disulfide (B) carbon dioxide (C) oxygen (D) sulfur

26. The average value of radius in the *1s* state of hydrogen atom is (a_o is Bohr's radius)
(A) 1.5 a_0 (B) a_0 (C) 0.75 a_0 (D) 0.5 a_0

27. Entropy of the system always…… in a reversible system
(A) increases (B) decreases (C) remains constant (D) zero

28. The reaction A→B has an equilibrium constant of $K = 10^{-4}$. Which one of the following statements is always correct?
(A) The reaction will have 50% product B and 50% reactant A at equilibrium.
(B) The reaction is very favourable and will have mostly product B at equilibrium.
(C) The reaction is unfavourable and will not have very much product B at equilibrium.
(D) The equilibrium constant only relates to the speed of a reaction and not to the amount of product formed.

29. How many faradays are required to reduce 1.00 g of aluminum(III) to the aluminum metal?

(A) 1.00 (B) 1.50 (C) 3.00 (D) 0.111

30. The electron transition between which two levels **releases** the most energy

(A) first to third (B) fourth to seventh

(C) sixth to third (D) second to first

31. A buffer solution contains ethanoic acid and its conjugate base; the pKa of ethanoic acid is 4.74. At what pH does the solution buffer?

(A) 3.0 (B) 4.0 (C) 5.0 (D) 6.0

32. A solution of a dye absorbs light of wavelength 480 nm, and for this absorption, the extinction coefficient is 18600 $dm^3\ mol^{-1}\ cm^{-1}$. A sample of the dye of unknown concentration is placed in an optical cell of path length 1 cm and the absorbance reading is 0.18. What is the concentration of the solution?

(A) 9.7×10^{-6}mol dm^{-3} (B) 3.0×10^{-6}mol dm^{-3}

(C) 2.0×10^{-6}mol dm^{-3} (D) 0.026 mol dm^{-3}

33. Which observation(s) reflect(s) colligative properties?

(I) A 0.5 m NaBr solution has a higher vapor pressure than a 0.5 m $BaCl_2$ solution.

(II) A 0.5 m NaOH solution freezes at a lower temperature than pure water.

(III) Pure water freezes at a higher temperature than pure methanol.

(A) only I (B) only II (C) only III (D) I and II

34. The nitrate of which of the following cations would exhibit paramagnetism to the GREATEST extent?

(A) Co^{3+} (B) Cr^{3+} (C) Fe^{3+} (D) Mn^{3+}

35. What is the total number of electrons in the correct Lewis dot formula of the sulfite ion?

(A) 8 (B) 24 (C) 26 (D) 30

36. Consider a solution which is 0.10 M in CH_3COOH and 0.20 M in $NaCH_3COO$. Which of the following statements is true?

(A) If a small amount of NaOH is added, the pH decreases very slightly.
(B) If NaOH is added, the OH^- ions react with the CH_3COO^- ions.
(C) If a small amount of HCl is added, the pH decreases very slightly.
(D) If more CH_3COOH is added, the pH increases.

37. What terms can arise from the configuration $2p^1 3p^1$?

(A) $^3D, ^1D, ^3P, ^1P, ^3S, ^1S$ (B) $^3F, ^1F, ^3D, ^1D, ^3S, ^1S$

(C) $^3F, ^1F, ^3P, ^1P, ^3S, ^1S$ (D) $^1D, ^3P, ^3S$

38. Consider the case of a radioactive element X which decays by electron (beta) emission with a half-life of 4 days to a stable nuclide of element Z. Which of the following statements is CORRECT?

(A) After 8 days the sample will consist of one-fourth element Z and three-fourths element X.
(B) Element Z will weigh exactly the same as element X when decay is complete (weighed to an infinite number of significant figures).
(C) 2.0 g of element X is required to produce 1.5 g of element Z after 8 days (to 2 significant figures).
(D) If element X as an atomic number equal to n, then element X has an atomic number equal to n-1.

39. Which of the following is an amorphous solid?

(A) Graphite (B) Quartz glass (SiO2)
(C) Chrome alum (D) Silicon carbide (SiC)

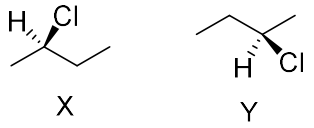
40. Which of the following crystals has unit cell such that $a \neq b \neq c$, $\alpha \neq \beta \neq \gamma \neq 90$

(A) $K_2Cr_2O_7$ (B) $NaNO_3$ (C) KNO_3 (D) A_8B_7

41. Strong field ligands such as CN^-:

(A) usually produce high spin complexes and small crystal field splittings.
(B) usually produce low spin complexes and small crystal field splittings.
(C) usually produce low spin complexes and high crystal field splittings.
(D) usually produce high spin complexes and high crystal field splittings.

42. Mark the relationship between following structures X and Y:



(A) Enantiomers (B) Diastereomers (C) Meso (D) Same

43. The intermediacy of triplet carbene in a reaction can be detected by reaction with:

(A) cis-2 Butene (B) 2-Butyene (C) n-Butane (D) 1-Butene

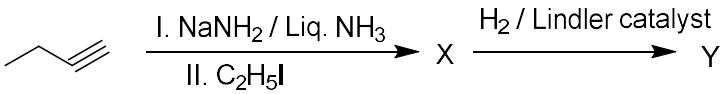
44. In Stevens rearrangement which reaction intermediate is involved?

(A) Ylide (B) Carbocation (C) Carbanion (D) Carbene

45. The major product formed by reaction of benzene with isobutyl alcohol in presence of Con. H_3PO_4 is:

(A) *n*-Butyl benzene (B) *iso*-Butyl benzene
(C) *sec*-Butyl benzene (D) *tert*.-butyl benzene

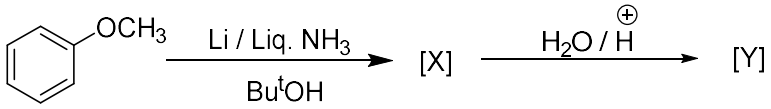
46. The product Y in following sequence of reactions is:



(A) *cis*- 3-Hexene (B) *trans*- 3-Hexene

(C) Hexane (D) 3-Ethyl but-1-yne

47. Product Y in the following sequence of reaction is:



(A) Cyclohexanol (B) Cyclohexanone

(C) Cyclohex-2-ene-1-one (D) Cyclohex-3-ene-1-one

48. Reaction of dimethylsulfolium methylide $(CH_3)_2S^+CH_2^-$ with benzaldehyde results in formation of:

(A) Acetophenone (B) Styrene oxide

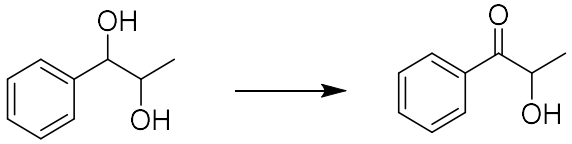
(C) α-Phenyl ethyl alcohol (D) 2-Phenyl propane-2-ol

49. Which intermediate is involved in Favorskii rearrangement?

(A) Cypclopropane (B) Cyclopropene

(C) Cyclopropanol (D) Cyclopropanone

50. The best reagent to achieve the following transformation is:



(A) CrO_3 /H_2SO_4 (B) CrO_3 /Pyridine

(C) Active MnO_2 (D) DMSO-$(COCl)_2$/ Et_3N

x-x-x

ROUGH WORK

Geology(Ph.D.)

1. What will be the strike of a vertical sandstone bed that is dipping N30°W?
(A) N60°W-S60°E (B) N60°E-S60°W (C) N30°E-S30°W (D) N30°W-S30°E

2. What is the nature of unconformity between the horizontal beds of Cretaceous and Silurian age?
(A) Disconformity (B) Paraconformity
(C) Buttress unconformity (D) Blended unconformity

3. Which one of the following distances is correct between two objects lying on a uniform slope and are 4 cm apart in a 1:50,000 scale topographic map?
(A) 1 km (B) 2 km (C) 4 km (D) 8 km

4. Using a Brunton compass, if the bearing from A to B is N30°W, the bearing from B to A will be
(A) S30°W (B) S30°E (C) S60°W (D) S60°E

5. The white needle of the Brunton compass gives the direct reading of bearing because
(A) E and W markings are transposed (B) E and W markings are unchanged
(C) N and S markings are transposed (D) N and S markings are unchanged

6. Which one of the following structures is suitable in the field for determination of current direction?
(A) Cross bedding (B) Mud cracks
(C) Asymmetrical ripple marks (D) Symmetrical ripple marks

7. Which one of the following rocks is suitable to determine attitude of beds?
(A) Mudrock (B) Siltstone (C) Claystone (D) Shale

8. Which one of the following rocks will require more quantity of sample for representative geochemical analysis?
(A) Andesite (B) Granodiorite (C) Rhyolite (D) Dunite

9. Which one of the following rocks is preferred to acquire accurate whole-rock geochemical analysis?
(A) Basalt devoid of amygdales and veins (B) Amygdaloidal basalt
(C) Basalt with calcite veins (D) Basalt with quartz veins

10. Which one of the following instruments is used to know the chemical composition of minerals?
(A) WD-XRF (B) ED-XRF (C) EPMA (D) SMRIMP

11. Flame Photometer is used to determine absolute concentrations of
(A) Na and Ca (B) Na and K (C) K and Ca (D) Ca and Mg

12. Which one of the following dating methods is preferred to determine the precise age of a high-grade metamorphic rock derived from an igneous protolith?

(A) U-Pb whole-rock isochron (B) U-Pb zircon Concordia

(C) U-Pb monazite Concordia (D) U-Pb whole-rock Concordia

13. Which one of the following is used in acid maceration to extract organic fossils from silicate rocks?

(A) Hydrofluoric acid (B) Hydrochloric acid

(C) Nitric acid (D) Acetic acid

14. What kind of method is applied for sampling of microfossils on an outcrop scale?

(A) Drill sampling (B) Bulk sampling

(C) Spot sampling (D) Grab sampling

15. Becke line is used to determine the relative _____ between two minerals.

(A) Birefringence (B) Refractive index

(C) Retardation (D) Optic orientation

16. Which one of the following interference colours is shown by quartz when it is viewed in a section cut perpendicular to its C axis?

(A) Yellow (B) Black (C) Dark grey (D) Light grey

17. A mineral with extremely high birefringence may show interference colour of

(A) Grey of first order (B) Yellow of first order

(C) Grey of fourth order (D) Pink of fourth order

18. During sample preparation for SEM studies, the gold sputtering is carried out to

(A) Avoid specimen charge-up (B) Strengthen the sample material

(C) Find penetration of Au in sample (D) Prevent sample disintegration

19. Which one of the following analytical instruments is used for complete REE analysis?

(A) Flame Photometer (B) Atomic Absorption Spectrophotometer

(C) X-ray Fluorescence (D) Inductively Coupled Plasma

20. Staining a thin section makes it easy to distinguish between colourless K-feldspar and plagioclase as they become

(A) Yellow K-feldspar and pink plagioclase (B) Blue K-feldspar and pink plagioclase

(C) Yellow K-feldspar and blue plagioclase (D) Pink K-feldspar and blue plagioclase

21. On a photo scale of 1:100000, a square shaped open cast iron ore mine of 1.5 km^2 would have an area of (in cm^2)

(A) 1.5 (B) 2.25 (C) 4.25 (D) 4.50

22. Water samples are filtered and acidified during collection to determine

(A) Trace metal concentrations (B) Salinity
(C) Hydrogen isotopes (D) Oxygen isotopes

23. Which of the following onsite parameters are measured during sampling of surface and groundwater?
(A) pH, dissolved oxygen and TDS
(B) pH, dissolved organic carbon and trichlorobenzene
(C) Dissolved oxygen, dissolved organic carbon and trichlorobenzene
(D) Trichlorobenzene, dissolved organic carbon and TDS

24. What would be the resultant topography if contour lines of different elevations unite to form one line?
(A) Steep slope (B) Vertical cliff (C) Overhanging cliff (D) Ridge

25. Which one of the following statements is correct?
(A) Contour lines can intersect each others
(B) The spacing between contour lines represents the angle of saddle
(C) Contour lines lie perpendicular to rivers
(D) Contour lines are connected by unequal elevations above a datum line

26. Which one of the following is the correct sequence of elements in Earth crust in decreasing order?
(A) O > Al > Fe > Si (B) O > Si > Al > Fe
(C) Si > Al > Fe > O (D) Si > Fe > Al > O

27. Which one of the following regions shows intraplate mafic volcanism?
(A) The Andes (B) The Alps
(C) The Caribbean islands (D) The Hawaiian islands

28. A transform fault indicates plate movement
(A) Parallel to the strike of the fault plane (B) Perpendicular to the strike of the fault plane
(C) 60° to the strike of the fault plane (D) 45° to the strike of the fault plane

29. Mineralogically, tonalite can be distinguished from trondhjemite on the basis of
(A) Higher amount of quartz (B) Lower amount of quartz
(C) Lower amount of biotite (D) Higher amount of biotite

30. Consider the following statements:
1. Fractional crystallisation of basaltic magma would increase the concentrations of Ni and Cr in the late liquid
2. Fractional crystallisation of basaltic magma would decrease the concentrations of Ni and Cr in the late liquid
3. Partial melting of mantle would lead to enrichment of Ni and Cr concentrations in the early generated melts

4. Partial melting of mantle would lead to enrichment of Rb and Ba concentrations in the early generated melts

Which of the following statements given above is/are correct?

(A) 1, 2 and 3 (B) 2, 3 and 4 (C) 2 and 4 (D) 3 only

31. Compared to post-Archean granitoids, the Archean TTG gneisses are characterised by

(A) High $(Gd/Yb)_N$ and high $(Yb)_N$ (B) Low $(Gd/Yb)_N$ and low $(Yb)_N$

(C) High $(La/Yb)_N$ and low $(Yb)_N$ (D) Low $(La/Yb)_N$ and high $(Yb)_N$

32. A rock with higher $^{143}Nd/^{144}Nd$ ratio indicates that it has formed by partial melting of

(A) Lower crust (B) Middle crust (C) Upper crust (D) Upper mantle

33. Zircon acts as an ideal mineral for U-Pb and Lu-Hf isotopic studies because it has

(A) Very high U/Pb and Lu/Hf ratios

(B) Very low U/Pb and Lu/Hf ratios

(C) Very low U/Pb and very high Lu/Hf ratios

(D) Very high U/Pb and very low Lu/Hf ratios

34. Dunham classification of sedimentary rocks is based on

(A) Texture and mud content of limestone (B) Chemical composition of limestone

(C) Texture and mud content of sandstone (D) Chemical composition of sandstone

35. The carbonate-hosted Pb-Zn deposits are commonly known as

(A) Mississippi Valley-type (B) Broken Hill-type

(C) Superior-type (D) Suwalki-type

36. Accumulation of material at the foot of a slope can lead to the formation of

(A) Proluvial placer (B) Eluvial placer (C) Lateral placer (D) Deluvial placer

37. The largest REE deposit in the world is located at

(A) Bayan Obo (B) Olympic Dam (C) Mount Weld (D) Mangistau Plains

38. Which one of the following is the correct sequence for the evolution of horse?

(A) Eohippus – Miohippus – Hipparion – Parahippus - Equus

(B) Eohippus – Pliohippus – Meryhippus – Parahippus - Equus

(C) Eohippus – Miohippus – Parahippus – Pliohippus – Equus

(D) Eohippus – Parahippus – Miohippus - Hipparion - Equus

39. Corals will record a period

(A) During a glacial maxima (B) After a glacial maxima

(C) After a thermal maxima (D) During a thermal maxima

40. Tonian marks the beginning of

(A) Early Neoproterozoic (B) Early Mesoproterozoic

(C) Early Paleoproterozoic (D) Early Paleoarchean

41. Which one of the following stratigraphic units are correctly arranged from older to younger?

(A) Alwar quartzite – Closepet granite – Muth quartzite – Kioto limestone

(B) Alwar quartzite – Closepet granite – Kioto limestone - Muth quartzite

(C) Closepet granite - Alwar quartzite – Muth quartzite – Kioto limestone

(D) Closepet granite - Alwar quartzite – Kioto limestone - Muth quartzite

42. Which one of the following natural inorganic constituents has a laxative effect when dissolved in ground water at higher concentrations (600-1000 mg/L)?

(A) Sulphate (B) Nitrate (C) Carbonate (D) Bicarbonate

43. Extremely high intakes of Se in drinking water can affect the

(A) Teeth (B) Kidneys (C) Hair (D) Nails

44. Acid mine drainage is caused by

(A) Weathering of limestone and sandstone (B) Weathering of shale and sandstone

(C) Acidic rain water (D) Dissolution of sulfide minerals

45. Which one of the following statements is correct?

(A) Ozone forms only in stratosphere

(B) Carbon dioxide is the only gas responsible for acid rain

(C) Temperature inversion in troposphere causes decrease in temperature with height

(D) Nitrogen is the most abundant gas in the atmosphere

46. Which of the following seismic body waves are released during an earthquake?

(A) P and S waves (B) P waves only

(C) S waves only (D) P, S and Rayleigh waves

47. The Bauguer correction is the adjustment to a measurement of gravitational acceleration, allowing for the attraction of rock between the observing station and

(A) Average composition of continental crust

(B) Average composition of oceanic crust

(C) Mean heat flow value of Earth

(D) Local datum plane

48. The variation in reflectivity and emissivity as a function of wavelength is called

(A) Temporal variation (B) Temporary variation

(C) Spectral variation (D) Spatial variation

49. Which one of the following is the most suitable clay mineral that is used in oil refining and drilling?

(A) Bentonite (B) Fire clay (C) Ball clay (D) Kaoline

50. Which one of the following sequence of rocks is correct in increasing order of compressive strength?

(A) Shale < Dolomite < Sandstone < Limestone

(B) Shale < Dolomite < Limestone < Sandstone

(C) Shale < Sandstone < Dolomite < Limestone

(D) Shale < Sandstone < Limestone < Dolomite

x-x-x

ROUGH WORK

Home Science(Ph.D.)

1. _____ is the first step of research
(A) Searching a research problem (B) Selecting a research problem
(C) Finding a problem (D) Identifying a research problem

2. Which of these is the most important feature in qualitative research?
(A) Data collection with standardised tools
(B) Design sampling with Probability sample techniques
(C) Data Collection with bottom up empirical evidence
(D) Data Collection with top down schematic evidence

3. Which of the following statement is true for testing of Hypotheses
(A) Only the Alternative hypothesis can be tested
(B) Only the Null hypotheses can be tested
(C) Both alternative and null hypotheses can be tested
(D) Both alternative and null hypotheses cannot be tested

4. The main objective of Interdisciplinary research is _____.
(A) To generate a new trend in research methodology
(B) To reduce the focus of single subject in the research area
(C) To simplify the research problem
(D) To bring out the holistic approach of research

5. Amongst the following, results of which type of research cannot be generalised?
(A) Comparative study (B) Descriptive Research
(C) Historical Research (D) Experimental Research

6. 'Theory of Cognitive Development of Humans' given by Jean Piaget was developed on the basis of _____.
(A) Applied Research (B) Evaluation Research
(C) Longitudinal Research (D) Fundamental Research

7. Factorial Analysis is used _____.
(A) To understand the difference between various variables
(B) To understand the relationship between the two variables
(C) To understand the difference between the two variables
(D) For setting up the hypotheses

8. Calculate the range of given sets of data 4, 17, 96, 74, 1, 42, 47, 56, 2, 75, 93, 42
(A) 16 (B) 94 (C) 70 (D) 48

9. Identify the correct statement amongst the following
(A) Reliability ensure validity
(B) Validity ensures reliability
(C) Reliability does not depend upon objectivity
(D) Reliability and validity are independent of each other

10. _____ is the major characteristic of Correlation Analysis
(A) Association among variables (B) Difference among Variables

(C) Regression among Variables (D) Variations among variables

11. 'Causal Comparative Research is also called _____?
(A) Historical research (B) Ex -Post Facto research
(C) Comparative Research (D) Descriptive Research

12. Find the arithmetic mean of the following data set 21, 09, 01, 11, 15, 10, 17, 13
(A) 21 (B) 01 (C) 13 (D) 12

13. When the population is finite, which sampling technique is most likely to be followed
(A) Purposive sampling (B) Cluster sampling
(C) Convenience sampling (D) Systematic Sampling

14. Calculate the range of given sets of data 4, 17, 96, 74, 1, 42, 47, 56, 75, 93, 42, 2
(A) 16 (B) 94 (C) 70 (D) 48

15. A research study carried out to solve immediate problems is
(A) A Longitudinal research (B) A Fundamental research
(C) An Applied research (D) An Action research

16. Random sample is a sample selected
(A) on the basis of specific criterion (B) as per researchers judgement
(C) using a random process (D) as per convenience

17. _____is not a type of research design
(A) Correlational design (B) Experimental design
(C) Probability design (D) Descriptive design

18. What are the variables whose calculations is done according to weight, height and length known as
(A) Measuring variables (B) Continuous Variables
(C) Discrete Variables (D) Flow Chart

19. Dependent variable in the research study is _____
(A) A variable manipulated by the researcher
(B) A variable not affected by other variables
(C) A variable controlled by research participants
(D) A variable that is measured or observed in response to the independent variable

20. Pilot study is done to
(A) to collect base line data (B) to calculate appropriate sample size
(C) to try out statistical tests (D) to test feasibility of research design

21. The purpose of Control group in an experimental design is
(A) to control the study
(B) to eliminate the effects of extraneous variables
(C) to manipulate independent variables
(D) to provide baseline against which experimental group can be compared

22. One of the characteristic advantage of case study research is
(A) allows generalisation to larger population
(B) can establish causation
(C) involves large sample size
(D) can provide in depth detailed data

23. Which of the following is not the characteristic of qualitative research
(A) allows for multiple perspectives
(B) focusses on subjective experiences
(C) uses statistical analysis
(D) emphasizes context and complexity

24. The variance is zero if all observations are
(A) Different (B) Square (C) Square Root (D) Same

25. The $\chi 2$ test should not be used if any expected frequency is
(A) Less than 10 (B) Less than 5
(C) Equal to 5 (D) More than 5

26. Identify the term/s associated with cereal cookery
(A) Coagulation (B) Gelatinization (C) Germination (D) Fermentation

27. International Literacy Day is celebrated on
(A) 8^{th} March (B) 8^{th} June (C) 8^{th} September (D) 8^{th} October

28. _____ symptom is observed in Kidney failure patients
(A) GFR 80 ml/min (B) GFR 20 ml/min or less
(C) Polyphagia (D) Polyuria

29. National Mission for Empowerment of women was launched on
(A) 15 August 2011 (B) 15 April 2011
(C) 15 August 2021 (D) 15 April 2012

30. Which of the following is a toxic component not found in pulses
(A) Haemagglutinins (B) Lathyrogens
(C) Alkaline Phosphatase (D) Trypsin Inhibitors

31. _____ can finish hundreds of garments at one time by a single operator
(A) Stream dolly (B) Tunnel finisher
(C) Carousel jeans finisher (D) Suction Counter Table

32. _____is an intense activity for motivating and mobilising community to action.
(A) Conference (B) Colloquium (C) Campaign (D) Consultation

33. Which of these is not a natural dye
(A) Heena (B) Indigo (C) Turmeric (D) Alum

34. Human cells contain _____pairs of chromosomes
(A) 21 (B) 22 (C) 23 (D) 24

35. Which of the following is not a simple yarn?

(A) Single (B) Textured (C) Ply (D) Cable

36. Total Parenteral Nutrition involves
(A) Use of peripheral veins to deliver nutrients
(B) Ingestion of food through the oral route
(C) Use of tube to deliver all nutrients including fluids
(D) Use of large central vein to deliver life sustaining nourishment

37. Which of the following is not a theory of Clothing
(A) Modesty (B) Amnesty (C) Protection (D) Adornment

38. Performance appraisals and review committees in an organisation are examples of
(A) External Evaluation (B) Internal Evaluation
(C) Summative Evaluation (D) Outline Evaluation

39. Degree of polymerisation for polyester ranges between
(A) 50-75 (B) 75-115 (C) 115-140 (D) 140-165

40. Food delivery system used for students in hostels is
(A) Decentralised system (B) Buffet
(C) Scrambled (D) Centralised

41. Chemical used in artificial ripening of fruits is
(A) Calcium Carbide (B) Benzene (C) Methanol (D) Xanthiol

42. Marionettes are also called
(A) Finger Puppets (B) Glove Puppets
(C) Shadow Puppets (D) String Puppets

43. _____called adolescence a stage of 'Stress and Storm'
(A) Hurlock (B) Aristotle (C) Stanley Hall (D) Ross

44. The thrust of Home Science Extension is
(A) Learning by doing (B) Part to Whole
(C) Simple to complex (D) Concrete to abstract

45. FSSAI stands for
(A) Food Safety and Standards Authority of India
(B) Food Standards and Safety Authority of India
(C) Food Safety and Standard Activity of India
(D) Food Satiety and Social Authority of India

46. The standards for space to be provided all around the building is referred to as
(A) Back Space (B) Front Space (C) Open space (D) Landscape

47. According to Wilson and Gallop, the first step in Extension teaching is
(A) Convincing the learner (B) Arousing learners desire
(C) Getting attention (D) Stimulating Learners Interest

48. Mental retardation is an indicator of deficiency of

(A) Iron (B) Iodine (C) Inositol (D) Insulin

49. Graphical mistakes and verbalism are the examples of

(A) Physical Barriers (B) Language Barriers

(C) Cultural Barriers (D) Psychological Barriers

50. MOOCs stand for

(A) Massive Open Online Courses (B) Mass Online Original Copies

(C) Machine Online Open Competitions (D) Manually Operated Open Courses

x-x-x

ROUGH WORK

Human Genomics(Ph.D.)

1. If a measurement does not have units we say that it is which of the following?
(A) Unitary (B) Infinite (C) Qualitative (D) Dimensionless

2. "My friend Raju has more than 1000 books", said Ram. "Oh no, he has less than 1000 books", said Shyam. "Well, Raju certainly has at least one book", said Geeta. If only one of these statements is true, how many books does Raju have?
(A) 1 (B) 1000 (C) 999 (D) 1001

3. A student appearing for an exam is declared to have failed the exam if his/her score is less than half the median score. This implies
(A) 1/4 of the students appearing for the exam always fail.
(B) if a student scores less than 1/4 of the maximum score, he/she always fails.
(C) if a student scores more than 1/2 of the maximum score, he/she always passes.
(D) it is possible that no one fails.

4. Which of the following statements is logically incorrect?
(A) I always speak the truth (B) I occasionally lie
(C) I occasionally speak the truth (D) I always lie

5. Brothers Santa and Banta walk to school from their house. The former takes 40 minutes while the latter, 30 minutes. One day Santa started 5 minutes earlier than Banta. In how many minutes would Banta overtake Santa?
(A) 5 (B) 15 (C) 20 (D) 25

6. How many times starting at 1:00 pm would the minute and hour hands of a clock make an angle of 40^0 with each other in the next 6 hours?
(A) 6 (B) 7 (C) 11 (D) 12

7. Fill in the blank: F2, _____, D8, C16, B32, A64.
(A) C4 (B) E4 (C) C2 (D) G16

8. The random errors associated with the measurement of P and Q are 10% and 2%, respectively. What is the percentage random error in P/Q?
(A) 12.0 (B) 9.8 (C) 8.0 (D) 10.2

9. Two cockroaches of the same species have the same thickness but different lengths and widths. Their ability to survive in oxygen deficient environments will be compromised if
(A) their thickness increases, and the rest of the size remains the same
(B) their thickness remains unchanged, but their length increases
(C) their thickness remains unchanged, but their width decreases
(D) their thickness decreases, but the rest of the size remains unchanged

10. A research student conducting experiments in lab and collecting data comes under
(A) primary data (B) derived data (C) secondary data (D) no data

11. Intravenous (IV) fluid has to be administered to a child of 12 kg with dehydration, at a dose of 20 mg of fluid per kg of body weight, in 1 hour. What should be the drip rate (in drops/min) of IV fluid? (1mg = 20 drops)
(A) 7 (B) 80 (C) 120 (D) 4

12. Accuracy and precision during a measurement are
(A) required (B) not required
(C) has no meaning during measurement (D) zero during a measurement

13. A man buys alcohol at Rs. 75/L, adds water, and sells it at Rs.75/L making a profit of 50%. What is the ratio of alcohol to water?
(A) 2:1 (B) 1:2 (C) 3:2 (D) 2:3

14. A and B walk up an escalator one step at a time, while the escalator itself moves up at a constant speed. A walks twice as fast as B. A reaches the top in 40 steps and B in 30 steps. How many steps of the escalator can be seen when it is not moving?
(A) 30 (B) 40 (C) 50 (D) 60

15. IPR stands for
(A) Individual property rights (B) Intellectual property rights
(C) Individual propriety rights (D) Intellectual propriety rights

16. A publication in a scientific journal is called as
(A) essay (B) research paper/article
(C) story (D) thesis

17. Statement-A. The following statement is true Statement-B. The preceding statement is false. Choose the correct inference from the following:
(A) Statements A and B are always true
(B) Statements A and B can be true if there is at least one statement between A and B
(C) Statements A and B can be true if there are at least two statements between A and B
(D) Statements A and B can never be true, independently

18. "All living organisms are made up of cells, tiger is a living organism, thus tiger is made up of cells." The reasoning used here is
(A) inductive (B) deductive (C) hypothetical (D) imaginary

19. A film projector and microscope give equal magnification. But a film projector is not used to see living cells because
(A) a living cell cannot be placed in a film projector
(B) the viewer's eye is close to a microscope hereas it is far away from the projector's screen
(C) a microscope produces a virtual image whereas a projector produces a real image
(D) a microscope has greater resolving power than a projector

20. . The imitation of a real thing or process is called as
(A) simulation (B) imitation (C) virtual testing (D) *In vitro*

21. A living cell has a protoplasm which is water based and demarcated by a lipid bilayer membrane. If a cell is pierced up to $1/5^{th}$ of its diameter with a very sharp needle, after taking the needle out

(A) no effect will be observed

(B) protoplasm will leak out from the hole made by the needle for a few minutes until the cell heals the wound

(C) protoplasm will keep on leaking out till the cell is dead

(D) the cell will burst like a balloon

22. In a group of siblings there are seven sisters and each sister has one brother. How many siblings are there in total?

(A) 15 (B) 14 (C) 8 (D) 7

23. A job interview is taking place with 21 male and 17 female candidates. Candidates are called randomly. What is the minimum number of candidates to be called to ensure that at least two male or two female candidates have been interviewed?

(A) 17 (B) 3 (C) 2 (D) 21

24. A 100m long train crosses a 200m long and 20m wide bridge in 20secs. What is the speed of the train in km/hr?

(A) 45 (B) 36 (C) 54 (D) 57.6

25. A dice was thrown three times and the outcome was repeatedly six. If the dice is thrown again, what is the possibility of getting six?

(A) 1/6 (B) 1/216 (C) 1 (D) 1/1296

26. With respect to their surrounding membrane system, which is the odd one out?

(A) Nucleus (B) Endoplasmic reticulum

(C) Mitochondria (D) Chloroplasts

27. Which of the following statements about glycolysis is correct?

(A) Glycolysis requires oxygen since it is involved in the oxidation of glucose

(B) The end products of glycolysis are always pyruvate and ATP

(C) The end products of glycolysis are always lactate and ATP

(D) Although glycolysis is a stage in the oxidation of glucose it can occur anaerobically

28. Which second messenger signals the release of Ca++ from the endoplasmic reticulum?

(A) Cyclic AMP (B) Cyclic GMP

(C) 1,2diacyl glycerol (D) Inositol triphosphate

29. Which of the following statements about the active site of an enzyme is correct?

(A) The active site of an enzyme binds the substrate of the reaction it catalyses more tightly than it does the transition state intermediate.

(B) The active site of an enzyme binds the substrate of the reaction it catalyses less tightly than it does the transition state intermediate.

(C) The active site of an enzyme binds the product of the reaction it catalyses more tightly than it does the transition state intermediate.

(D) The active site of an enzyme is complementary to the substrate of the reaction it catalyses.

30. Which of the following reactions is required for proofreading (i.e. correcting replication errors) during DNA replication by DNA polymerase III?

(A) 3' - 5' exonuclease activity (B) 5' - 3' exonuclease activity
(C) 3' - 5' endonuclease activity (D) 5' - 3' endonuclease activity

31. Which of the following can be described as 'a sequence that can be several thousand base pairs upstream or downstream of a eukaryotic promoter and which increases gene expression as much as 200-fold.'

(A) CAAT box (B) TATA box (C) Insulator (D) Enhancer

32. What would be the effect on the primary structure of the coded protein if a single base was deleted from a messenger RNA transcript?

(A) No effect
(B) A single amino acid residue is changed
(C) A complete change in amino acid sequence from the point of the deletion
(D) A premature termination of the chain at the point of mutation

33. In bacterial promoters, which of the following describes the 'Pribnow box'?

(A) The 5' untranslated region (B) The -10 box
(C) The -35 box (D) The termination sequence

34. A mouse, true breeding for normal gait, was crossed with a mouse, true breeding for an odd gait called 'dancing'. The F1 animals all showed normal gait. What is the most likely proportion of dancing mice in the F2 generation?

(A) 1/3 (B) 1/4 (C) 3/4 (D) 0

35. What is the purpose of QTL analysis?

(A) The calculation of a concordance value
(B) The identification of chromosome regions associated with a complex trait
(C) The identification of additive genes
(D) The discrimination between traits that vary continuously and discontinuously

36. Schizophrenia has a heritability of 0.8. Choose the most accurate from the following options.

(A) Schizophrenia is inherited from a parent 80% of the time
(B) Schizophrenia is 100% dependent upon genetic inheritance
(C) Schizophrenia is largely influenced by environmental factors
(D) Schizophrenia is both influenced by environmental factors and dependent upon genetic inheritance

37. Which of the following would you calculate to investigate whether there is a relationship between two variables?

(A) Correlation coefficient (B) Variance

(C) Standard deviation (D) Selection coefficient

38. Which of the following defines the Hardy-Weinberg equilibrium?
(A) constant allele frequencies which do not change from generation to generation
(B) heterozygosity at all loci
(C) elimination of all lethal alleles
(D) elimination of genetic drift

39. In an EMSA experiment free DNA is separated from protein-DNA complexes in a native gel by which following principle?
(A) Charge (B) Molecular weight
(C) DNA digestion with DNAse (D) Antibody immunoprecipitation

40. A single celled spherical bacteria contains 70%. If it loses 10% of its water content, how much its surface area will change by approximately?
(A) 3% (B) 5% (C) 6% (D) 7%

41. Only one amino acid has two identical groups attached to its central carbon atom. Which of the following amino acids is it?
(A) Alanine (B) Valine (C) Glycine (D) Cysteine

42. Which one of the following relationships is true in water at 25ºC?
(A) [H+] = [H2O] (B) [OH-] = [H2O-]
(C) Kw> 1 10-14 (D) [H+] = [OH-]

43. In a typical polymerase chain reaction (PCR), the reaction mixture was cycled between 95°C, 55°C and 72°C. If the composition/length of the primer is altered, which temperature(s) should be altered?
(A) 95°C (B) 55°C (C) 72°C (D) 55°C and 72°C

44. 2D Gel-electrophoresis can be used to separate all the proteins expressed in a tissue (the 'proteome'). Separation in each of the two dimensions is achieved by
(A) 1st dimension native protein electrophoresis, 2nd dimension SDS-PAGE
(B) 1st dimension SDS-PAGE under oxidising conditions, 2nd dimension SDS PAGE under reducing conditions
(C) 1st dimension SDS PAGE, 2nd dimension isoelectric focussing
(D) 1st dimension isoelectric focussing, 2nd dimension SDS PAGE

45. Which one of the following best defines an oncogene?
(A) An oncogene never codes for a cell cycle protein, which promotes cell proliferation
(B) Oncogenes are always involved in inherited forms of cancer
(C) An oncogene codes for a protein that prevents a cell from undergoing apoptosis
(D) An oncogene is a dominantly expressed mutated gene that renders a cell advantageous towards survival

46. Which one of the following statements is correct for amplified-fragment length polymorphism (AFLP)?
(A) PCR using a combination of random and gene-specific primers
(B) PCR amplification followed by digestion with restriction enzymes
(C) Digestion of DNA with restriction enzymes followed by one PCR step
(D) Digestion of DNA with restriction enzymes followed by two PCR steps

47. As topoisomerases play an important role during replication, a large number of anticancer drugs have been developed that inhibit the activity of these enzymes. Which of the following statements is **NOT** true about topoisomerases as a potential anticancer drug target?
(A) As cancer cells are rapidly growing cells, they usually contain higher level of topoisomerases
(B) The transient DNA breaks created by topoisomerases are usually converted to permanent breaks in the genome in the presence of topoisomerase targeted drugs
(C) As cancer cells often have impaired DNA repair pathways, they are more susceptible towards topoisomerase targeted drugs
(D) The drugs which specifically target topoisomerases, usually do not affect normal fast growing cells

48. Cancer is often believed to arise from stem cells rather than fully differentiated cells. Following are certain views related to the above statement. Which one of the following is **NOT** correct?
(A) Stem cells do not divide and therefore require fewer changes to become a cancer cell.
(B) Cancer stem cells can self-renew as well as generate the non-stem cell populations of the tumor.
(C) Teratocarcinomas prove tumors arise from stem cells without further mutations.
(D) Stemness genes can often function as oncogenes.

49. Two interacting genes (independently assorting) were involved in the same pathway. Absence of either genes function leads to absence of the end product of the pathway. A dihybrid cross involving the two genes is carried out. What fraction of the F2 progeny will show the presence of the end product?
(A) 1/4 (B) 3/4 (C) 9/16 (D) 15/16

50. As cancer progresses, several genome rearrangements including translocation, deletion, duplications etc. occur. If these rearrangements are to be identified, which of the following techniques would be most suitable?
(A) RAPD (B) Microarray
(C) Multi-colour FISH (D) Flow cytometry

x-x-x

ROUGH WORK

Microbial Biotechnology(Ph.D.)

1. Who was the author of the book named "Methods in Social Research"?
(A) Kerlinger (B) CR Kothari (C) Goode and Hatt (D) Wilkinson

2. What is the major attribute of Correlation Analysis?
(A) Association among variables (B) Difference among variables
(C) Regression among variables (D) Variations among variables

3. What is the name of the conceptual framework in which the research is carried out?
(A) Research hypothesis (B) Synopsis of Research
(C) Research paradigm (D) Research design

4. Which of the following features are considered as critical in qualitative research?
(A) Collecting data with the help of standardized research tools.
(B) Design sampling with probability sample techniques.
(C) Collecting data with bottom-up empirical evidence.
(D) Gathering data with top-down schematic evidence.

5. In order to pursue the research, which of the following is priorly required?
(A) Developing a research design
(B) Formulating a research question
(C) Deciding about the data analysis procedure
(D) Formulating a research hypothesis

6. What is the main aim of interdisciplinary research?
(A) To over simplify the problem of research
(B) To bring out the holistic approach to research
(C) To create a new trend in research methodology
(D) To reduce the emphasis on a single subject in the research domain

7. The Mean of a constant 'x' is
(A) 0 (B) x/2 (C) x (D) 1

8. Ethical norms in research do not involve guidelines for:
(A) Copyright (B) Thesis format (C) Patenting policy (D) Data sharing policies

9. Sampling error decreases with the
(A) Process of analysis (B) Increase in sample size
(C) Decrease in sample size (D) Process of randomization

10. A researcher is interested in studying the prospects of a particular political party in an urban area. What tool should he prefer for the study?
(A) Interview (B) Schedule (C) Rating scale (D) Questionnaire

11. Participant observation is the process of immersing yourself in the study of
(A) People (B) Options (C) Methods (D) Outcomes

12. A research problem is not feasible if
(A) It is researchable
(B) It has utility and relevance
(C) It is new and adds something to knowledge
(D) It consists of independent and dependent variables

13. Research ethics has a direct connection more often with which stages of research?
(A) Defining and delimiting the scope of research
(B) Deciding about statistical techniques and data analysis
(C) Problem formulation and reporting of research findings
(D) Defining the population and deciding the sampling technique for research

14. The core elements of dissertation are
(A) Research Plan; Research Data; Analysis; References
(B) Executive Summary; Literature review; Data gathered; Conclusions; Bibliography
(C) Introduction; Literature Review; Research Methodology; Results; Discussion and Conclusion
(D) Introduction; Data Collection; Data Analysis; Conclusions and Recommendations

15. Which of the following is not the critical feature of qualitative research?
(A) Researcher becomes immersed in the situation, present or past related to the phenomena.
(B) Seeking to establish relationships among measured social facts.
(C) Actual settings are the direct source of data.
(D) Data take the forms of words or pictures.

16. A detailed description of methodology of research is required in
(A) Thesis/Dissertation
(B) Symposium/Workshop
(C) Seminar paper/Articles
(D) Conference and Seminar Paper

17. In qualitative research paradigm, which of the following features may be considered critical?
(A) Data collection with standardized research tools.
(B) Data collection with bottom-up empirical evidences.
(C) Sampling design with probability sample techniques.
(D) Data gathering to take with top-down systematic evidences

18. Which one of the following is the most comprehensive source of population data?
(A) Census
(B) National Sample Surveys
(C) Demographic Health Surveys
(D) National Family Health Surveys

19. Which one of the following principles is not applicable to sampling?
(A) Sample units must be clearly defined
(B) Sample units must be dependent on each other
(C) Same units of sample should be used throughout the study
(D) Sample units must be chosen in a systematic and objective manner

20. The importance of the correlation co-efficient lies in the fact that:
(A) It is one of the most valid measure of statistics.
(B) It is a non-parametric method of statistical analysis.
(C) There is a linear relationship between the correlated variables.
(D) It allows one to determine the degree or strength of the association between two variables.

21. The F-test:
(A) is essentially a two tailed test.
(B) is essentially a one tailed test.
(C) can be one tailed as well as two tailed depending on the hypothesis.
(D) can never be a one tailed test.

22. Which statistical test is used to compare group means in a sample?
(A) Correlation (B) Regression (C) Covariance (D) ANOVA

23. Which one is called non-probability sampling?
(A) Quota sampling (B) Cluster sampling
(C) Systematic sampling (D) Stratified random sampling

24. Which one among the following phrases does not correspond to the meaning of research as a process?
(A) Problem Solving (B) Trial and Error
(C) Objective Observation (D) Systematic Activity

25. Find the arithmetic mean of the set of data: 6,1,5,8, and 10
(A) 4 (B) 5 (C) 6 (D) 7

26. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?
(A) Condenser lens (B) Magnifying lens (C) Objective lens (D) Eyepiece lens

27. Competitive inhibitor of an enzyme is
(A) Structural analogue of enzyme (B) Functional analogue of enzyme
(C) Functional analogue of substrate (D) Structural analogue of substrate

28. Which of the following is the reason for Gout disease?
(A) Deficiency of Xanthine Oxidase enzyme
(B) Overproduction of Xanthine Oxidase
(C) Deficiency of ß-galactosidase enzyme
(D) Deficiency of Lipase enzyme

29. Deficiency of the enzyme ß-glucocerebrosidase results in
(A) Gaucher's Disease (B) Faber's disease
(C) Krabbe's disease (D) Lesh-Nyhan Syndrome

30. Which of the following enzymes is elevated in alcoholism
(A) Hepatitis (B) Serum Glutamate Pyruvate Trasmittase
(C) Acid Phosphatase (D) Glutamyl transpeptidase

31. Which is the most abundant biomolecule on earth?
(A) Mineral salts (B) Proteins (C) Lipids (D) Carbohydrates

32. Which of the following statements is true about the IgM of humans?
(A) IgM can cross the placenta
(B) IgM can protect the mucosal surface
(C) IgM is produced by high-affinity plasma cells
(D) IgM is primarily restricted in the circulation

33. Name the cytokines which are released in response to virus infection?
(A) Interferons (B) Monokines (C) Lymphokines (D) Interleukins

34. Which of the following bacterium is called as superbug that could clean up oil spills?
(A) *Bacillus subtilis* (B) *Pseudomonas putida*
(C) *Pseudomonas denitrificans* (D) *Bacillus denitrificans*

35. The 2023 World Intellectual Property Day theme is
(A) Innovate for a Green Future
(B) IP and Youth Innovating for a Better Future
(C) Focused on Women and IP: Accelerating Innovation and Creativity
(D) Reach for Gold: IP and Sports

36. Name the group of pattern recognition molecules which functions exclusively as a signaling receptor.
(A) CRP (B) Toll-like receptor (C) MBL (D) LPS

37. The human genome project was launched in the year
(A) 1980 (B) 1973 (C) 1990 (D) 1989

38. Paper chromatography is an example of which form of chromatography?
(A) solid-solid (B) liquid-liquid (C) gas-liquid (D) solid-liquid

39. Where is the World Intellectual Property Organization located?
(A) Geneva (B) London (C) Perth (D) Florida

40. Name the nerve stimulator which is responsible for the pain of the inflammation.
(A) Bradykinins (B) Prostaglandin (C) Histamines (D) Kinins

41. The first transgenic plant to be produced is
(A) Brinjal (B) Tobacco (C) Rice (D) Cotton

42. The expression of a transgene in the target tissue is identified by a
(A) Transgene (B) Promoter (C) Enhancer (D) Reporter

43. The first clinical application of gene therapy over a 4 years old girl was for
(A) Adenosine deaminase deficiency (B) Adenosine deficiency

(C) Growth deficiency (D) Adenine deficiency

44. Which one is a criteria for the registration of a new seed variety?
(A) Market demand (B) Distinctiveness
(C) Customer acceptance (D) Insect-pests resistance

45. The first vaccine developed from animal cell culture was
(A) Small pox vaccine (B) Influenza vaccine
(C) Hepatitis B vaccine (D) Polio vaccine

46. Milk fermentation to produce cheese is done initially by inoculating with
(A) *Saccharomyces cerevisiae*
(B) *Streptococcus lactis* and *Lactobacillus* spp.
(C) *Acetobacter* and *Gluconobacter*
(D) *Lactobacillus bulgaricus* and *Streptococcus thermophilus*

47. What is the percentage of acetic acid in commercially available vinegar?
(A) 4% (B) 2% (C) 10% (D) 12%

48. Name the phenomenon which shows the lack of correlation in genome size and genetic complexity.
(A) Histogram paradox (B) Karyogram (C) Dendrogram (D) C-value

49. Statute of Anne got Royal assent on
(A) 5th April 1710 (B) 25th April 1710 (C) 1st July 1842 (D) 30th April 1842

50. Which of the following is the first completed and published gene sequence?
(A) ΦX174 (B) T4 phage (C) M13 phage (D) Lambda phage

x-x-x

Microbiology(Ph.D.)

1. Which of the following is NOT a characteristic of qualitative research?
   (A) Objective and numerical data (B) Subjective interpretation
   (C) In-depth understanding (D) Flexible research design

2. Which of the following sampling techniques is commonly used when the population is geographically dispersed?
   (A) Cluster sampling (B) Snowball sampling
   (C) Convenience sampling (D) Stratified sampling

3. Which of the following statistical tests is used to compare means between two groups?
   (A) Chi-square test (B) t-test
   (C) ANOVA (D) Regression analysis

4. Which of the following is an example of a non-parametric statistical test?
   (A) t-test (B) ANOVA
   (C) Chi-square test (D) Pearson correlation

5. Which of the following is a method of data collection commonly used in quantitative research?
   (A) Focus groups (B) In-depth interviews
   (C) Participant observation (D) Surveys

6. Which of the following is a common measure of association used in regression analysis?
   (A) R-squared (B) p-value
   (C) Chi-square statistic (D) Odds ratio

7. What is the purpose of random sampling in research?
   (A) To select a representative sample (B) To increase sample size
   (C) To control for confounding variables (D) To ensure internal validity

8. Which of the following is a type of research bias?
   (A) Random error (B) Sampling error
   (C) Selection bias (D) Type II error

9. What is the purpose of statistical significance testing in research?
   (A) To summarize data
   (B) To make predictions
   (C) To determine the relationship between variables
   (D) To assess the likelihood of obtaining results by chance

10. Which of the following is a measure of association used in bivariate analysis?
    (A) Analysis of variance (ANOVA) (B) t-test
    (C) Pearson correlation coefficient (D) Chi-square test
11. Which of the following is a type of probability sampling technique?

(A) Purposive sampling (B) Snowball sampling
(C) Convenience sampling (D) Stratified sampling

12. What is the purpose of research participant recruitment?
(A) To report research findings
(B) To analyze research data
(C) To obtain informed consent from participants
(D) To select appropriate statistical tests

13. The regression equation of x on y is expressed as _____.
(A) y=a+b (B) y=ab (C) y=a+bx (D) y = a/bx

14. The hypothesis is true but our test rejects it. It is known as _____ .
(A) Type I error. (B) Type II error.
(C) Wrong decision. (D) None of these

15. _____curve should begin and end at the baseline.
(A) ogives (B) frequency
(C) histogram (D) none of these

16. Decrease in one variable influences the decrease in other variable is _____.
(A) multiple correlations (B) simple correlation
(C) negative correlation (D) positive correlation

17. The spearman rank correlation coefficient is a_____ measure of rank correlation.
(A) parametric (B) non-parametric
(C) linear (D) non-linear

18. In a positively skewed distribution mean>median is _____.
(A) lesser than mode (B) equal to mode
(C) greater than mode (D) none

19. A grouped distribution can be represented by _____.
(A) Frequency polygon. (B) Histogram.
(C) Frequency curve. (D) Ogives.

20. Preliminary data collection is a part of the_____
(A) Descriptive research (B) Exploratory research
(C) Applied research (D) Explanatory research

21. If a solution has to be a buffer, its pH should be
(A) at its pka value (B) at its ka value
(C) at 7 (D) at 14

22. If DNA is digested by endonucleases in four sites giving rise to fragments of which two are equal in length how many bands would be seen after electrophoresis?
(A) 3 (B) 4
(C) 5 (D) 6

23. Which of the following is commonly used as the mobile phase in GC-MS?
(A) CH_3CN (B) He
(C) H_2O (D) Air

24. The eluent strength is a measure of
(A) solvent absorption energy (B) solvent adsorption energy
(C) solvent diffusivity (D) solvent mixing index

25. Beer Lambert's law gives the relation between which of the following?
(A) Reflected radiation and concentration
(B) Scattered radiation and concentration
(C) Energy absorption and concentration
(D) Energy absorption and reflected radiation

26. Which of the following is a method used for the scale-up of fermentation processes?
(A) Decreasing the agitation rate (B) Reducing the aeration rate
(C) Increasing the reactor volume (D) Lowering the temperature

27. Which of the following is an example of a lignocellulosic substrate used in second-generation bioethanol production?
(A) Glucose (B) Sucrose
(C) Corn starch (D) Corn stover

28. Which of the following is an example of an intracellular metabolite produced during fermentation?
(A) Ethanol (B) Lactic acid (C) Acetic acid (D) ATP

29. The process by which mRNA molecules are synthesized from a DNA template is called:
(A) Transcription (B) Translation (C) Replication (D) Recombination

30. Which of the following is responsible for catalyzing the formation of peptide bonds during protein synthesis?
(A) tRNA (B) mRNA (C) rRNA (D) DNA

31. Which of the following techniques is used to analyze gene expression patterns on a genome-wide scale?
(A) Polymerase chain reaction (PCR) (B) Western blotting
(C) Microarray analysis (D) Gel electrophoresis

32. Which of the following is a toxin produced by *Staphylococcus aureus* that causes food poisoning?
(A) Botulinum toxin (B) Shiga toxin
(C) Enterotoxin (D) Hemolysin

33. Which of the following is a commonly used antimicrobial agent in food to inhibit microbial growth?

(A) Sodium chloride (B) Citric acid
(C) Sodium benzoate (D) Calcium carbonate

34. Which of the following is an example of a foodborne pathogen commonly associated with contaminated meats and unpasteurized dairy products?
(A) *Listeria monocytogenes* (B) *Clostridium perfringens*
(C) *Vibrio parahaemolyticus* (D) *Staphylococcus aureus*

35. Which of the following is a sexually transmitted infection caused by the bacterium *Treponema pallidum*?
(A) Chlamydia (B) Gonorrhea (C) Syphilis (D) Herpes

36. Which of the following microorganisms is responsible for causing infectious diarrhea in infants and young children?
(A) Rotavirus (B) Norovirus
(C) *Campylobacter jejuni* (D) *Escherichia coli*

37. Which of the following microorganisms is commonly associated with nosocomial (hospital-acquired) infections?
(A) *Escherichia coli* (B) *Staphylococcus aureus*
(C) *Streptococcus pneumonia* (D) *Clostridium difficile*

38. Which of the following is the primary function of natural killer (NK) cells?
(A) Phagocytosis
(B) Antibody production
(C) Cytotoxicity against virus-infected cells and tumor cells
(D) Antigen presentation

39. Which of the following is a protein complex that enhances the inflammatory response and attracts immune cells to the site of infection?
(A) Interleukin-1 (IL-1) (B) Interleukin-2 (IL-2)
(C) Tumor necrosis factor-alpha (TNF-alpha) (D) Interferon-gamma (IFN-gamma)

40. Which of the following is the process by which antibodies and complement proteins coat microorganisms, promoting their recognition and phagocytosis?
(A) Opsonization (B) Complement activation
(C) Neutralization (D Antigen presentation

41. Which of the following is a process used to reduce the concentration of heavy metals in contaminated soil using microorganisms?
(A) Phytoremediation (B) Bioleaching
(C) Chemical precipitation (D) Electrochemical remediation

42. Which of the following microorganisms is commonly used in the biodegradation of recalcitrant organic pollutants, such as polychlorinated biphenyls (PCBs)?
(A) *Escherichia coli* (B) *Pseudomonas aeruginosa*
(C) *Bacillus subtilis* (D) White-rot fungi

43. Which of the following is a process used to convert atmospheric nitrogen into ammonia through industrial processes?
(A) Nitrification (B) Denitrification
(C) Ammonification (D) Haber-Bosch process

44. Which of the following is a bacterium responsible for causing dental caries (tooth decay)?
(A) *Streptococcus mutans* (B) *Escherichia coli*
(C) *Staphylococcus aureus* (D) *Pseudomonas aeruginosa*

45. Which of the following is a technique used to analyze the expression of genes in a sample?
(A) Southern blotting
(B) Western blotting
(C) Polymerase chain reaction (PCR)
(D) Reverse transcription-polymerase chain reaction (RT-PCR)

46. Which of the following is a technique used to study the interactions between microorganisms within a community?
(A) Metagenomics (B) Proteomics (C) Transcriptomics (D) Genomics

47. Which of the following is a type of immunization that uses antibodies derived from human or animal sources to provide immediate protection against an infectious agent?
(A) Passive immunization (B) Active immunization
(C) Herd immunity (D) Natural immunity

48. Which of the following is a mechanism used by pathogens to evade host immune responses?
(A) Antibiotic resistance (B) Toxin production
(C) Biofilm formation (D) Antigenic variation

49. Which of the following is a key component of the CRISPR-Cas9 system used for genome editing?
(A) RNA polymerase (B) DNA helicase
(C) RNA interference (RNAi) (D) Guide RNA (gRNA)

50. Which of the following is involved in the processing of pre-mRNA molecules into mature mRNA molecules?
(A) tRNA (B) mRNA (C) rRNA (D) Spliceosome

x-x-x

Physics(Ph.D.)

1. If BROTHER is coded as 2456784, SISTER is coded as 919684, then what is the code for ROBBERS?
(A) 18252251819 (B) 4562684 (C) 9245784 (D) 4522849

2. Which of the following statements is correct?
(A) In research, objective can be worded in question form

(B) In research, objectives can be worded in statement form

(C) Objectives are to be stated in the middle of the thesis

(D) Objectives can be worded either in statement or question form

3. Which one of the following is the least important in effective communication?
(A) Full control on language

(B) Good vocabulary

(C) Attractive personality of messenger

(D) Full control over communicable subject

4. Which of the following will be acceptable for establishing a scientific fact?
(A) Opinion of a large number of people

(B) Traditionally in practice over a long period of time

(C) References in ancient literature

(D) Availability of observable evidences

5. A family has a man, his wife, their 4 sons and their wives. The family of every son also has three sons and one daughter. Find out the total number of male members.
(A) 1 (B) 12 (C) 04 (D) 17

6. Research is done for
(A) Improving qualification (B) Adding to one's reputation

(C) Adding to the existing knowledge (D) Meeting the job requirements

7. A and B are sisters. R and S are brothers. A's daughter is R's sister. What is B's relation to S?
(A) Mother (B) Grandmother (C) Sister (D) Aunt

8. Two resistances 100Ω ± 5Ω and 150Ω±15Ω are connected in series. If the deviations are standard deviations, the resultant resistance can be expressed as

(A) 250Ω ± 20Ω (B) 250Ω ± 10Ω (C) 250Ω ± 15.8Ω (D) 250Ω ± 10.6Ω

9. 15,000,000 cm can be expressed by two significant numbers as

(A) 150 km (B) 1.5×10^7 cm (C) 0.15×10^6 cm (D) 0.0150×10^9 cm

10. If a map is magnified from 1:20,000 to 1:1,00,000 then its area will be

(A) 25 times of original area (B) 20 times of original area

(C) 10 times of original area (D) 5 times of original area

11. What is the name of the conceptual framework in which the research is carried out?

(A) Research hypothesis (B) Synopsis of research

(C) Research paradigm (D) Research design

12. The format of thesis writing is the same as in

(A) Writing of seminar representation

(B) Preparation of research paper/article

(C) A research dissertation

(D) Presenting a workshop/conference paper

13. How to judge the depth of any research?

(A) By research title (B) By research duration

(C) By research objectives (D) By total expenditure on research

14. A man is facing south. He turns 135 degrees in the anticlockwise direction and then 180 degrees in the clockwise direction. Which direction he is facing now?

(A) North-east (B) North-west (C) South-east (D) South-west

15. There are two bunches of resistors. The first bunch of resistor has one third more resistors than the second bunch. If the second bunch has three resistors less than the first bunch, how many resistors has the first bunch?

(A) 6 (B) 9 (C) 12 (D) 15

16. In which of the following types of communication methods can "Audio conferencing" be classified?

(A) One sided verbal (B) Two sided verbal

(C) One sided non-verbal (D) Two sided non-verbal

17. If 2/3 of a number is $1/4^{th}$ of another number, what is the ratio between these two numbers?

(A) 3:7 (B) 2:12 (C) 3:8 (D) 2:8

18. A group of experts in a specific area of knowledge assembled at a place and prepared a syllabus for a new course. The process may be termed as

(A) Seminar (B) Conference (C) Workshop (D) Symposium

19. If 60% of the students in a school are boys and the number of girls is 972, how many boys are there in the school?

(A) 1258 (B) 1458 (C) 1324 (D) 1624

20. If the confidence level is 0.95, then the values lying outside the confidence interval are

(A) 1 in 5 (B) 1 in 20 (C) 1 in 100 (D) 1 in 1000

21. A set of measurement of an experimental data shows the values 28.7, 28.9 and 28.8 while the true value is 24.4, thus the experimental data shows

(A) Good accuracy but poor precision (B) Good accuracy and good precision

(C) Poor accuracy but good precision (D) Poor accuracy and poor precision

22. Keeping all the parameter same if the standard deviation is doubled, variance would be

(A) No effect (B) Doubled (C) Quadrupled (D) Halved

23. The degree to which numerical data tend to spread about an average value is known as

(A) Mean (B) Measure of variation

(C) Both (A) and (B) (D) Kutosis

24. A statistical inference can be defined as

(A) Reaching conclusions from a sample (B) Analysing statistical data

(C) Applying statistical methods (D) Developing statistical theories

25. The value of the middle most observation, when the data are arranged in ascending or descending order of magnitude is known as

(A) Arithmetic mean (B) Median (C) Mode (D) None of these

26. What is the value of $\Gamma\left(-\frac{5}{2}\right)$?

(A) $\sqrt{\pi}$ (B) $-\frac{8}{15}\sqrt{\pi}$ (C) $-\frac{10}{15}\sqrt{\pi}$ (D) $\sqrt{\frac{\pi}{2}}$

27. What is the singularity of the complex function $f(z)=\frac{1}{z}$?

(A) $z = 0$ is an isolated singular point

(B) The function has an isolated singular point only when $z = \frac{1}{n\pi}$

(C) $z = 0\ and\ 1$ are singular points

(D) $z = 1$ is an isolated singular point

28. What is the value of $\int_0^1 P_l(x)dx$ for *l*=0 ($P_l(x)$ is the Legendre polynomials)?

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) 0 (D) 1

29. Consider a Maxwellian distribution of the velocity of the molecules of an ideal gas. Let v_{mp} and v_{rms} denote the most probable velocity and the root mean square velocity, respectively. The magnitude of the ratio $\frac{v_{rms}}{v_{mp}}$ is

(A) $\sqrt{\frac{3}{2}}$ (B) $\frac{2}{3}$ (C) $\sqrt{\frac{2}{3}}$ (D) $\frac{3}{2}$

30. For the differential equation $x^2y'' + xy' + (x^2 - m^2)y = 0$

(A) x = 0 is a regular singular point

(B) x = 0 is not a regular singular point

(C) x = 0 is a irregular singular point

(D) x = 0 can't be a singular point of any type

31. What is the approximate Fermi Kinetic energy of the nucleons (either proton or neutron) in case of a self-conjugate nuclei with N=Z=A/2 ?

(A) 150 MeV (B) 33 MeV (C) 0.5 MeV (D) 200 MeV

32. A gas behaves as an ideal gas at

(A) Very low pressure and high temperature (B) High pressure and low temperature

(C) High temperature and high pressure (D) Low pressure and low temperature

33. Which of the following statement is not correct for a compound nuclear reaction

(A) Compound nuclear reaction is symmetric around 90 degree

(B) Mass distribution obtained in case of compound nuclear reaction is symmetric

(C) The reaction products peak around the grazing angle

(D) Light ion induced compound nuclear reaction follow Bohr's independence hypothesis

34. The energy of a free particle moving in one-dimension is

(A) Non-degenerate
(B) Doubly degenerate
(C) Infinitely degenerate
(D) As energy is continuous we can't find degeneracy

35. Which of the following statement is true about a vibrational nucleus.

(A) Vibrational nucleus are mostly deformed in nature.
(B) Adding a two quadrupole phonon to the ground state of the vibrational nucleus results in 0^+, 4^+ and 2^+ state.
(C) Vibrational nucleus normally show 0^+, 2^+, 4^+ and 6^+ like spectrum.
(D) The highest mode of a vibrational nucleus is limited to λ=2 (quadrupole) vibration.

36. Which one of the following sets corresponds to fundamental particles?

(A) Proton, electron and neutron (B) Proton, electron and photon
(C) Electron, photon and neutrino (D) Quark, electron and meson

37. When a system is held at constant temperature and pressure in a state of equilibrium, then it attains a minimum value of

(A) Internal energy (B) Enthalpy
(C) Helmholtz energy (D) Gibb's free energy

38. Which of the following statements about Hall coefficient of a material is true?

(A) It can be negative
(B) It cannot be negative
(C) It has value equal to zero for some material
(D) It can be a complex number for some material

39. Meissner effect implies that in superconducting state, a material has a magnetic susceptibility equal to

(A) $\chi = 0$ (B) $\chi = -1$ (C) $\chi = 1$ (D) $\chi = \infty$

40. The critical magnetic field for a solid in superconducting sate

(A) Does not depend on temperature
(B) Increases if the temperature increases
(C) Increases if the temperature decreases
(D) Does not depend on transition temperature

41. Which of the following condition on electrostatic potential V is incorrect?

(A) Must be zero if boundary is earthed
(B) Must go to zero at infinite if charge distribution are finite
(C) Must be constant throughout any conductor
(D) Must be discontinuous across any boundary

42. The field of magnetic vector $\vec{B}$ is always

(A) Irrotational (B) Solenoidal (C) Non-solenoidal (D) Both (A) and (C)

43. The Eigen values of a observable associated with a physical quantity are $0\ and\ 1$. The expectation value of measurement is

(A) 0 (B) Either 0 or 1 (C) Between 0 and 1 (D) 1

44. How many electron (fermions) can be adjusted into three dimensional harmonic oscillator upto energy level $\frac{7}{2}\hbar\omega$

(A) 10 electron (B) 12 electron (C) 19 electron (D) 20 electron

45. Consider the following three equations

I. Schrödinger equation,

II. Klein-Gordon equation and

III. Dirac equation

Which of the above is/are of first order in $\frac{d}{dt}$

(A) I only (B) I and II (C) II and III (D) I, II and III

46. The Joule-Thomson expansion produced cooling:

(A) At all initial temperatures and pressures (B) Above certain initial temperature

(C) Above certain initial pressure (D) Below certain initial temperature

47. For a 12-bit A/D converter, the range of input signal is $0\ to\ +10\ V$. The voltage corresponding to $1LSB$ will be

(A) 0 (B) 0.0012V (C) 0.0024V (D) 0.833V

48. If J is angular momentum of system and $H$is Hamiltonian of system, then the value of Poission Bracket $[J, H]$ gives

(A) Force (B) Torque (C) Power (D) Energy

49. A particle is moving in an inverse square field. If the total energy of the particle is positive, then the trajectory of the particle is

(A) Circular (B) Elliptical (C) Parabolic (D) Hyperbolic

50. If transformations $Q = q + i\alpha p, P = q - i\alpha p$ are canonically transformed, then the value of α is given by

(A) $\frac{i}{2}$ (B) $-\frac{i}{2}$ (C) $2i$ (D) $-2i$

x-x-x

ROUGH WORK