Question Booklet Series: **A** *Question Booklet Serial No.:* **211535**

CET (UG) – 2022

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No. ***(In Figure)*** ***(In Words)***

O.M.R. Answer Sheet Serial No.

Signature of Candidate: _____ *Signature of Invigilator:* _____

SUBJECT: CHEMISTRY

Time: 70 Minutes **Number of Questions: 60** **Maximum Marks: 120**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO.

INSTRUCTIONS:

1. Write your Roll No. on the Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Question Booklet Serial No. on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. The medium of examination shall be **English** only.
5. Please check that this Question Booklet contains **60** Questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of Test.
6. Each question has four alternative answer (A,B,C,D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Booklet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
9. **Negative marking will be adopted for evaluation i.e. 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.**
10. For calculations, use of log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the blank sheet at the end of the Question Booklet be used.
12. The Answer Sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e. not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
15. **20 minutes** extra should be given to the visually handicapped/Person with Disability (PwD) for each paper.
16. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistant or found giving or receiving assistant or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
17. Tele-communication equipment such as Cellular phones, pager, wireless, scanner, camera or any electronic/digital gadget etc., is not permitted inside the examination hall. **Use of calculators is not allowed**.
18. The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.

1. Maximum number of molecules are present in which of the following?
   (A) 7g N_2 (B) 2g H_2
   (C) 16g NO_2 (D) 16g O_2

2. 333g of $Al_2(SO_4)_3.18H_2O$ will contain how many numbers of water molecules?
   (A) $18.0 \times 6.023 \times 10^{23}$ (B) $9.0 \times 6.023 \times 10^{23}$
   (C) 18.0 (D) 36.0

3. The empirical formula of an organic compound containing carbon, hydrogen and oxygen with the elemental analysis as C, 38.71% and H, 9.67%would be
   (A) CHO (B) CH_4O
   (C) CH_3O (D) CH_2O

4. Who put forward the nuclear theory of the atom?
   (A) Rutherford (B) Aston
   (C) Neils Bohr (D) J. J. Thomson

5. Electromagnetic radiation with maximum wavelength is
   (A) Ultra-violet (B) Radiowave
   (C) X-rays (D) Infrared

6. The magnetic quantum number represents
   (A) Size of the orbital (B) Spin angular momentum
   (C) Orbital angular momentum (D) Spatial orientation of orbital

7. The element with atomic number 55 belongs to which block of the periodic table
   (A) s-block (B) p-block
   (C) d-block (D) f-block

8. Modern periodic table is based on the concept of
   (A) Atomic mass (B) Mass number
   (C) Atomic number (D) Atomic volume

9. Which of the following is the least acidic?
   (A) HF (B) HCl
   (C) HBr (D) HI

10. Which of the following species has the greatest proton affinity to form stable compound?
    (A) NH_2^- (B) F^-
    (C) I^- (D) HS^-

11. Which of the following molecules has trigonal planar geometry?
    (A) BF_3 (B) NH_3
    (C) PCl_3 (D) IF_3

12. Among the following, which substance act as surface active agents is/are
    (A) Soap (B) Acetone
    (C) Methyl alcohol (D) All of these

13. With rise in temperature the viscosity of a liquid _____
(A) Increases (B) Decreases
(C) Remains constant (D) May increase or decrease

14. Helium is preferred in balloons instead of hydrogen because it is
(A) Radioactive (B) More abundant
(C) Incombustible (D) Lighter than hydrogen

15. Water evaporation is
(A) An exothermic change
(B) An endothermic change
(C) A process where no heat changes occur
(D) A process accompanied by chemical reaction

16. The correct order of increasing basicity of the given conjugate bases ($R=C_2H_5$) is
(A) $RCOO^- < HC\equiv C^- < NH_2^- < R^-$ (B) $RCOO^- < HC\equiv C^- < R^- < NH_2^-$
(C) $R^- < HC\equiv C^- < RCOO^- < NH_2^-$ (D) $RCOO^- < NH_2^- < HC\equiv C^- < R^-$

17. The conjugate acid base pair in the reaction $HCN + H_2O \rightleftharpoons H_3O^+ + CN^-$ is
(A) HCN, H_3O^+ (B) H_2O, CN^-
(C) CN^-, H_3O^+ (D) HCN, CN^-

18. Following is true for the zwitter ion, $H_3N^+CH_2COO^-$?
(A) $H_2NCH_2COO^-$ is its conjugate base (B) $H_3N^+CH_2COOH$ is its conjugate acid
(C) Both of the above (D) None of these

19. How many mL of 1M H_2SO_4 is required to neutralise 10 mL of 1M NaOH solution?
(A) 2.5 (B) 5.0
(C) 10.0 (D) 20.0

20. Which one of the following statements is not true?
(A) Among halide ions, iodide is the most powerful reducing agent
(B) Fluorine is the only halogen that does not show a variable oxidation state.
(C) HOCl is a stronger acid than HOBr.
(D) HF is a stronger acid than HCl.

21. The Lewis acid in the following is
(A) $(CH_3)_2O$ (B) $(CH_3)_2P$
(C) $(CH_3)_2N$ (D) $(CH_3)_2B$

22. In which of the compounds the Carbon is in its lowest oxidation state?
(A) CH_4 (B) CCl_4
(C) CF_4 (D) CO_2

23. Nitrogen exhibits highest oxidation state in which of the following compounds?
(A) N_2H_4 (B) NH_3
(C) N_3H (D) NH_2OH

24. The hybridization of oxygen atom in H_2O_2 is
(A) sp^3d (B) sp
(C) sp^2 (D) sp^3

25. Which one of the following is a pseudo solid?
(A) Diamond (B) Glass
(C) Rock salt (D) $CaCO_3$

26. The carbon dioxide molecule will remain in which of the following shape?
(A) Octahedral (B) Linear
(C) Tetrahedral (D) Square planar

27. Which one of the following compound will not give a positive Lassaigne's test for nitrogen?
(A) Urea (B) Hydrazine
(C) Azobenzene (D) Phenyl hydrazine

28. Which of the following is correct for the paper chromatography?
(A) Mobile phase is liquid and stationary phase is solid
(B) Mobile phase is solid and stationary phase is liquid
(C) Both mobile and stationary phases are solids
(D) Both mobile and stationary phases are liquids

29. The name for neo-pentane according to IUPAC nomenclature is
(A) 2-methylbutane (B) 2,2-dimethylpropane
(C) 2-methylpropane (D) 2,2-dimethylbutane

30. How many isomers are possible for the compound having molecular formula $C_3H_5Br_3$?
(A) 5 (B) 4
(C) 6 (D) 8

31. The resonance effect will not be observed in which of the following molecules?
(A) $C_6H_5NH_2$ (B) $C_6H_5NH_3^+$
(C) C_6H_5OH (D) C_6H_5Cl

32. Which of the following functional groups will exert +R resonance effect?
(A) -CN (B) -CHO
(C) $-NH_2$ (D) $-NO_2$

33. Which of the following structural isomer of C_6H_{14} contains quaternary C-atom?
(A) 2,3-dimethylbutane (B) 2,2-dimethylbutane
(C) 3-methylpentane (D) 2-methylpentane

34. The correct indication of the substituents according to Fisher projection is
(A) Horizontal substituents above the plane
(B) Vertical substituents above the plane
(C) Both horizontal and vertical substituents above the plane
(D) Both horizontal and vertical substituents below the plane

35. The process for the conversion of liquid hydrocarbons to a mixture of gaseous hydrocarbons is
(A) Oxidation (B) Cracking
(C) Distillation under reduced pressure (D) Hydrolysis

36. When huge amount of sewage is dumped in river the Biological Oxygen Demand will
(A) Increase (B) Remain unchanged
(C) Decrease (D) Increase or decrease

37. The primary constituents of the photochemical smog are
(A) SO_2 and CO (B) NO_2 and hydrocarbons
(C) CO_2 and NO_2 (D) Hydrocarbons and CFCs

38. Which of the following compounds is not a green house gas?
(A) CO_2 (B) CH_4
(C) NO_2 (D) CFCs

39. How many different basic crystal systems are known?
(A) 7 (B) 4
(C) 14 (D) 3

40. The Molality of 1M solution of $NaNO_3$ (density of solution is 1.25 g/ml and mo. Wt. of $NaNO_3$ = 85g/mol)will be
(A) 1.286 (B) 4.44
(C) 0.858 (D) None of these

41. Which of the following is a colligative property?
(A) Surface tension (B) Viscosity
(C) Refractive index (D) Osmotic pressure

42. The solubility of gas in liquid will increase with
(A) Increase in temperature (B) Reduction of gas pressure
(C) Decrease in temperature (D) Amount of liquid taken

43. Molten sodium chloride conducts electricity due to the presence of
(A) Free electrons (B) Free ions
(C) Free molecules (D) Atoms of sodium and chloride

44. The unit of specific conductivity is
(A) Ohm cm^{-1} (B) Ohm cm^{-2}
(C) $Ohm^{-1}cm$ (D) $Ohm^{-1}cm^{-1}$

45. The substance having highest conductivity at room temperature among the following is
(A) 0.1 N HCl (B) 0.1 N NaCl
(C) Graphite (D) Glass

46. A reaction is 50% complete in 2 hours and 75% complete in 4 hours. The order of the reaction is

(A) 0 (B) 1
(C) 2 (D) 3

47. The minimum energy necessary to permit a reaction is

(A) Internal energy (B) Threshold energy
(C) Activation energy (D) Free energy

48. Effect of temperature on reaction rate is given by

(A) Claisen-Clapeyron equation (B) Arrhenius equation
(C) Gibb's-Helmholtz equation (D) Kirchoff's equation

49. If the rate of the reaction is equal to the rate constant, the order of the reaction is

(A) 0 (B) 1
(C) 2 (D) 3

50. Tyndall effect in a colloid is due to

(A) Interference of light (B) Diffraction of light
(C) Reflection of light (D) Scattering of light

51. An emulsifier is known to

(A) Stabilize the emulsion (B) Coagulate the emulsion
(C) Homogenise the emulsion (D) None of the these

52. An example of water in oil type emulsion is

(A) Milk (B) Butter
(C) Gelatin (D) Both (B) and (C)

53. Fog is an example of

(A) Liquid dispersed in solid (B) Solid dispersed in gas
(C) Solid dispersed in liquid (D) Liquid dispersed in gas

54. Metals occur in the native form because of their

(A) High electronegativity (B) High retentivity
(C) Low reactivity (D) Low density

55. Among the enlisted compounds, which is used as a froth stabilized in the froth flotation process?

(A) Aniline (B) Phenol
(C) Benzaldehyde (D) Anisole

56. The most abundant ore of iron is

(A) Haematite (B) Limonite
(C) Magnetite (D) Siderite

57. Which of the following suggests the correct hybridization and structure of XeOF4

(A) sp^3d, trigonal bipyramidal (B) sp^3d, square pyramidal
(C) sp^3d^2, octahedral (D) sp^3d^2, square pyramidal

58. Hydrogen bonding does not play any role in boiling of

(A) NH_3 (B) H_2O

(C) HI (D) C_2H_5OH

59. The strongest bond is present in

(A) Br_2 (B) I_2

(C) Cl_2 (D) F_2

60. Which of the following oxides is expected to exhibit paramagnetic behaviour?

(A) CO_2 (B) SiO_2

(C) SO_2 (D) ClO_2

x-x-x