P.G. ENTRANCE EXAMINATION, APRIL 2022

FORENSIC SCIENCE

Time : Two Hours Maximum : 400 Marks

Each question carries 4 marks.

1 mark will be deducted for each wrong answer.

1. The system of units followed in science is :

   (a) C.G.S. system. (b) F.P.S. system.

   (c) S.I. system. (d) F.P.S. system.

2. A cube has nearly equal volume and surface area. The volume of such a cube is :

   (a) 20000 units. (b) 1000 units.

   (c) 216 units. (d) 3000 units.

3. The unit of length, mass and time, each be doubled, the unit of force is increased by :

   (a) 8 times. (b) 4 times.

   (c) No change. (d) 2 times.

4. Error in the measurement of radius of a sphere is 1 % then error in the measurement of volume is :

   (a) 1 %. (b) 3 %.

   (c) 5 %. (d) 8 %.

5. Which of the following is not a vector ?

   (a) Energy. (b) Velocity.

   (c) Momentum. (d) Moment of a force.

6. The direction of velocity and acceleration of a projectile at the highest point on the trajectory are :

   (a) Perpendicular to each other. (b) Parallel to each other.

   (c) Antiparallel to each other. (d) No specific relation exists between them.

7. A riffle bullet loses $1/20^{th}$ of its velocity in passing through a plank. The least number of such planks required just to stop the bullet is :

   (a) 11. (b) 12.

   (c) 10. (d) 20.

8. For a freely falling body the quantity that remains constant is :

(a) Velocity. (b) Acceleration.

(c) Displacement. (d) None.

9. An explosion blows a rock into three parts. Two pieces go off at right angles to each other, namely, a 100 kg piece at 12 m/s and a 200 kg piece at 8 m/s. The third piece flies off with a velocity of 25 m/s. Find the mass of the third piece in kg :

(a) 20. (b) 10.

(c) 80. (d) 40.

10. Newton's first law of motion gives the concept of :

(a) Work. (b) Energy.

(c) Inertia. (d) Momentum.

11. A truck of mass 1500 kg is speeding with a uniform velocity of 4 m/s How much force should be applied inorder to bring it to halt in a distance of 200 m ?

(a) 1000 N. (b) 1500 N.

(c) 3000 N . (d) 6000 N.

12. When the momentum of a body is doubled, the Kinetic Energy is :

(a) Doubled. (b) Increases 4 times.

(c) Increases 3 times. (d) Halved.

13. What happens to the co-efficient of friction when the normal reaction is halved ?

(a) Doubled.

(b) Halved.

(c) Depends on the natie of the surface.

(d) No change.

14. For an electron circulating around the nucleus, the centripetal force is supplied by :

(a) Gravitational force. (b) Magnetic force.

(c) Electromagnetic force. (d) Electrostatic force.

15. A ring, a disc, a hollow sphere and a solid sphere take part in a running race on an inclined plane. If all of them have the same mass and same radius, which of them will win the race :

(a) Solid sphere. (b) Disc.

(c) Ring. (d) Hollow sphere.

16. Newton's law of coolong is applicable to :

(a) Convection losses. (b) Natural convection losses.

(c) Forced convction losses. (d) None of the above.

17. Which of the following statements is wrong :

(a) Sound is a form of energy.

(b) Sound travles as waves.

(c) Sound travels faster in vacuum than in air.

(d) Sound travels in a straight line.

18. Just before the time of sunset the sun appears to be elliptical because :

(a) Of the effects of refraction.

(b) The sun changes its shape at that time.

(c) Of the scattering of light.

(d) Of the effects of diffraction.

19. The spreading of white light into its component colours is known as :

(a) Diffraction. (b) Refraction.

(c) Dispersion. (d) Reflection.

20. How much current flows through a lamp in one hour if the current through its is 0.5 A ?

(a) 7200 coulomb. (b) 1800 coulomb.

(c) 0.5 A. (d) None of the above.

21. Best insulator among the following is :

(a) Ebonite. (b) Cotton.

(c) Graphite. (d) Wood.

22. In a capillary tube the meniscus of mercury is :

(a) Concave. (b) Convex.

(c) Plane. (d) Plano concave.

23. ———————— remains constant in a isothermal process.

(a) Temperature. (b) Pressure.

(c) Volume. (d) None of the above.

24. Recoiling of gun is an example of :

(a) Newton's first law of motion. (b) Newton's second law of motion.

(c) Newton's third law of motion. (d) Both (a) and (b).

25. How much is one horse power ?

(a) 715 watts. (b) 7.46 watts.

(c) 746 watts. (d) 700 watts.

26. Epiblast present in certain monocot embryo represents :

(a) Rudimentary leaves. (b) Scutellum.

(c) Secondary cotyledon. (d) Mesocotyl.

27. Features of hotspots is/are :

1 Extremely high species diversity and exceptionally high species richness.

2 High endemicity.

3 Threatened flora and fauna.

4 Rapid modification, degradation and loss of habitat.

(a) 1 and 3. (b) 1, 2 and 3.

(c) 2 only. (d) 1, 2, 3 and 4.

28. The plant hormone which reduces the transpiration rate in plants by promoting stomatal closure is :

(a) Auxin. (b) Cytokinin.

(c) Abscisic acid. (d) Ethylene.

29. Phylloclades are :

1 Green, photosynthetic, thick leaves.

2 Green, photosynthetic, succulent stems of indefinite growth.

3 Flattened, photosynthetic shoots.

4 Modified branches for adaptation in water plants.

(a) 1 and 4. (b) 1 and 3.

(c) 2 and 3. (d) 3 and 4.

30. In plants, the cell organelle involved in Glycolate cycle is :

(a) Peroxisomes. (b) Chloroplast.

(c) Mitochondria. (d) Golgi body.

31. Normal distribution is :

(a) Symmetric around the variance. (b) Symmetric around the mean.

(c) Symmetric around the median. (d) Symmetric around the mode.

32. Okazaki fragments are :

(a) Small segments of DNA in 3' to 5' direction.

(b) Small segments of DNA in 5' to 3' direction.

(c) Small segments of RNA in 3' to 5' direction.

(d) Small segments of RNA in 5' to 3' direction.

33. The lac operon consists of :

(a) One operator, promoter and regulator genes.

(b) One operator, three regulator and three structural genes.

(c) One regulator, one operator, one promoter and three structural genes.

(d) Three regulator genes, three promoters, three operators and three structural genes.

34. Which one of the following is not a cause for microevolutionary change :

(a) Mutation. (b) Artificial selection.

(c) Random mating. (d) Gene flow and genetic drift.

35. Repeated occurrence of high temperature in malaria at intervals is due to :

(a) Exoerythrocytic schizogony. (b) Sporogony.

(c) Gamogony. (d) Erythrocytic schizogony.

36. Seminal fluid is a gelatinous material produced in males by :

(a) Seminal vesicles, Prostate and Cowper's gland.

(b) Pituitary gland, Seminal vesicles and Testis.

(c) Prostate gland and Testis.

(d) Epididymis, Prostate gland and Testis.

37. Which one of the following statements is/are correct :

1 Cocaine interferes with the reuptake of the neurotransmitter dopamine.

2 Amphetamine stimulates the excessive release of dopamine.

3 Δ9-tetrahydrocannabinol acts by binds to cannabinoid receptors and suppressing synaptic transmission.

4 Marijuana affects the hippocampus, cerebellum, and hypothalamus.

(a) 1 and 2. (b) 2 and 4.

(c) 1, 3 and 4. (d) All the above.

38. The chromosome pattern in Turner's syndrome is :

(a) 45 + XO. (b) 46 + XO.

(c) 45 + XXY. (d) 45 + XYY.

39. Dye used in gram staining is :

(a) Rhodamine and trypan blue. (b) Methelene blue and Safranin.

(c) Methelene blue and Eosin Y. (d) Giemsa and Acridine orange.

40. The water vascular system is a hydraulic system used by echinoderms helps in :

(a) Food and waste transportation, and respiration.

(b) Locomotion only.

(c) Locomotion, food and waste transportation, and respiration.

(d) Locomotion, food and waste transportation, circulation, and respiration.

41. Which of the following is a non-reducing sugar ?

(a) Maltose. (b) Sucrose.

(c) Lactose. (d) Cellobiose.

42. The enzyme Telomerase is a :

(a) RNA dependent DNA polymerase.

(b) DNA dependent DNA polymerase.

(c) RNA dependent RNA polymerase.

(d) DNA dependent RNA polymerase.

43. Difference between serum and plasma is :

(a) Plasma lacks albumin.

(b) Serum contains antihemophilic factor.

(c) Both serum and plasma have same composition.

(d) Serum lacks albumin.

44. Which of the following pair is/are correctly matched between COVID-19 vaccine and type of vaccine based on its design ?

1 Covishield	(i) Protein subunit vaccine.
2 Pfizer-BioNTech	(ii) mRNA vaccine.
3 AstraZeneca	(iii) Viral vector vaccine.
4 Covaxine	(iv) Inactivated viral vaccine.

(a) 1 and 4. (b) 2 and 3.

(c) 1, 3 and 4. (d) All the above.

45. Which of the following is an example of ex-situ conservation :

(a) National park, Wildlife sanctuary, sacred groves.

(b) Sacred groves, Botanical gardens, Zoological parks.

(c) Seed bank, Botanical gardens, Cryopreservation.

(d) Tissue culture banks, Wildlife sanctuary, community reserves.

46. The fixative commonly used for the fixation of chromosomes and nucleic acids is :

(a) Formalin. (b) Carnoy's fluid.

(c) Bouins's solution. (d) 70 % ethanol.

47. An example of structural chromosomal aberration is :

(a) Cri-du-chat syndrome. (b) Edward's syndrome.

(c) Turner's syndrome. (d) Down's syndrome.

48. Higher resolution of electron microscope than the light microscope is due to :

(a) Difference in stains.

(b) Wavelength of electron is longer than light.

(c) Wavelength of electron is shorter than light.

(d) Electrons can penetrates tissues better than light.

49. The phenomena which changes the gene expression without changing the DNA sequence is called :

(a) Epistasis. (b) Mutation.

(c) Epigenetics. (d) Imprinting.

50. The common effector caspase is :

(a) Caspase 2. (b) Caspase 3.

(c) Caspase 8. (d) Caspase 9.

51. Exemplars in forensic science refers to :

(a) Eyewitness. (b) Known sample.

(c) Evidence container. (d) None of the above.

52. The sequential record of evidence from crime scene to court is known as :

(a) Chain of custody. (b) Chain of evidence.

(c) Report of custody. (d) Report of evidence.

53. The determination of force direction in glass fracture is established by :

(a) RR rule. (b) 2R rule.

(c) 4R rule. (d) R2 rule.

54. 'Every contact leaves a trace' is proposed by :

(a) Hans Gross. (b) Edmomd Locard.

(c) Albert S. Osborn. (d) Henry Lee.

55. In fingerprint science 'Plastic prints' means :

(a) Three dimensional prints. (b) Two dimensional prints.

(c) One dimensional prints. (d) Latent prints.

56. Choking is commonly seen in :

(a) Missile. (b) Shotgun.

(c) Bullet. (d) Magazine.

57. ASTM sieves are used for the forensic examination of :

(a) Hair. (b) Blood.

(c) Soil. (d) Glass.

58. ———— is used to partition the components of a liquid mixture into two immiscible solvent phases of different densities.

(a) Separatory funnel. (b) Conical flask.

(c) Measuring cylinder. (d) Bunsen burner.

59. ———— is detected by Marquis test.

(a) Cyanide. (b) Mercury.

(c) THC. (d) Morphine.

60. On an adult skeleton age can be determined best from :

(a) Pelvis. (b) Skull.

(c) Ribs. (d) Clavicle.

61. Body in outdoors are first approached by :

(a) Centipedes. (b) Spiders.

(c) Carrion beetles. (d) Blow flies.

62. Which among the following is a microcrystal test ?

(a) Takayama test. (b) Benzidine test.

(c) Luminol test. (d) None of the above.

63. Christmas tree stain is used for the identification of :

(a) Blood. (b) Saliva.

(c) Urine. (d) Sperm.

64. Which among the following is not a high explosive :

(a) RDX. (b) PETN.

(c) TNT. (d) Black powder.

65. The sequence of amplification process in PCR is :

(a) Denaturation, Annealing and Extention.

(b) Extention, Annealing and Denaturation.

(c) Denaturation, Extention and Annealing.

(d) Denaturation, Denaturation and Extention.

66. ———————— analysis is done in forensic DNA profiling for determining the gender.

(a) Y-STRs. (b) RFLP.

(c) mtDNA. (d) X-STRs.

67. Section 293 CrPC explains about :

(a) Reports of certain Government scientific experts.

(b) Procedure of arrest and duties of officer making arrest.

(c) Authorities before whom affidavits may be sworn.

(d) Procedure in case of person of unsound mind tried before Court.

68. Modus operandi refers to :

(a) Collection of evidence. (b) Packing of evidence.

(c) Method of operation. (d) Method of opening.

69. ———————— is a numeric value of a fixed length that uniquely identifies data.

(a) Byte. (b) Bit.

(c) Hash value. (d) Binary digit.

70. A network infrastructure developed for a large citty is ————————.

(a) VAN. (b) LAN.

(c) MAN. (d) IP.

71. File System Forensics is generally used for :

(a) Discovering the locations of files.

(b) Moving the location of files.

(c) Analysing the deleted data.

(d) Recovering the deleted data.

72. Printer port in a computer is an example of :

(a) Serial port. (b) Parallel port.

(c) Both (a) and (b) (d) None of the above.

73. Memory forensics is also kown as :

(a) CPU forensics. (b) RAM forensics.

(c) Data forensics. (d) USB forensics.

74. Byte addressable memory are :

(a) Read only. (b) Write only.

(c) Read/write both. (d) Blank.

75. The unused space in a file allocation block or memory page that may hold residual data :

(a) Empty space. (b) Blank space.

(c) Used space. (d) Slack space.

76. A pair of molecules that are non-superimposable mirror images of each other are :

(a) Enantiomers. (b) Diastereomers.

(c) Both (a) and (b) (d) None of the above.

77. Galvanized iron sheets are coated with ————————.

(a) Iron. (b) Silver.

(c) Chromium. (d) Zinc.

78. Laughing gas is :

(a) Nitogen dioxide. (b) Nitric oxide.

(c) Nitrous oxide. (d) Nitrous dioxide.

79. pH is a measure of the ———————— concentration.

(a) Hydrogen ion. (b) Oxygen ion.

(c) Nitrogen ion. (d) Sulphur ion.

80. An aqueous solution is one in which the solvent is :

(a) Liquid water. (b) Kerosene.

(c) Alcohol. (d) None of the above.

81. Positively charged ions are called :

(a) Cations. (b) Anions.

(c) Both (a) and (b). (d) Neutral ions.

82. IUPAC name of $H_3C\text{-}O\text{-}C_2H_5$ is :

(a) Ethylmethylether.

(b) Methylethylether.

(c) Methoxyethane.

(d) Ethixymethane.

83. The compound that does *not* answer idoform test is :

(a) Methanol. (b) Ethanol.

(c) Ethanal. (d) Propanone.

84. How many kinds of space lattices are possible in a crystal ?

(a) 7. (b) 23.

(c) 14. (d) 230.

85. As the temperature increases, the ionic product of water :

(a) Increases.

(b) Decreases.

(c) Remains constant.

(d) First increases and then decreases

86. The passage of 10800 C of electricity through an electrolyte deposited 2.977 g of metal with atomic mass 106.4 amu. The valency of metal cation is

(a) 4. (b) 5.

(c) 3. (d) 2.

87. Radioactivity obeys :

(a) First order. (b) Second order.

(c) Third order. (d) Zero order.

88. Micelles are :

(a) Suspensions. (b) Colloids.

(c) Proteins. (d) Gels.

89. The strongest reducing agent is :

(a) HF. (b) HBr.

(c) HI. (d) HCl.

90. The most stable +2 oxidation state is exhibited by :

(a) Fe. (b) Sn.

(c) Pb. (d) Si.

91. Permanent magenets are generally made of alloys of :

(a) Aluminium. (b) Copper.

(c) Silver. (d) Lead.

92. Vanadium is a member of :

(a) s-block. (b) p-block.

(c) f-block. (d) d-block.

93. The valence shell of transition elements consists of :

(a) (n-1) d orbitals.
(b) (n-1) d ns np orbitals.
(c) nd orbitals.
(d) ns nd orbitals.

94. If steel is heated to a temperature well below red heat and is then cooled slowly, the process is called :

(a) Tempering.
(b) Softening.
(c) Hardnening.
(d) Annealing.

95. Cis-trans isomers are also called :

(a) Optical isomers.
(b) Geometrical isomers.
(c) Chirality.
(d) Functional isomers.

96. As branching of chain increases the boiling points of alcohols :

(a) Increases.
(b) Increases then decreases.
(c) Remains the same.
(d) Decreases.

97. Formalin is :

(a) 96.5 % ethanol.
(b) 8 % aqueous solution of formic acid.
(c) 40 % solution of formic acid.
(d) 40 % solution of methanal.

98. Gabriel synthesis is used for the synthesis of :

(a) Acids.
(b) Aldehydes.
(c) Secondary amines.
(d) Primary amines.

99. The substance which serve as carbohydrates in animal is :

(a) Glycogen.
(b) Starch.
(c) Cellulose.
(d) Sucrose.

100. Machite green is a :

(a) Acid dye.
(b) Azo dye.
(c) Basic dye.
(d) Vat dye.