

P.G./INTEGRATED PG ENTRANCE EXAMINATION, APRIL 2023**FORENSIC SCIENCE**

Time : Two Hours

Maximum : 400 Marks

*Each question carries 4 marks.
1 mark will be deducted for each wrong answer.*

1. Evidence that is transferred from a source to a location with no intermediaries is said to have undergone :
 - (a) Indirect Transfer.
 - (b) Direct Transfer.
 - (c) Intermediate Transfer.
 - (d) Both (a) and (b).
2. Principle of comparison refers to :
 - (a) Only the likes can be compared.
 - (b) Only the dislikes can be compared.
 - (c) Both likes and dislikes can be compared.
 - (d) None of the above.
3. The word 'Forensic' mean :
 - (a) For the Forum.
 - (b) Before the Forum.
 - (c) Beside the Forum.
 - (d) After the Forum.
4. Mitochondrial DNA can be used for understanding :
 - (a) Maternal lineage.
 - (b) Gender identification.
 - (c) Individual identification.
 - (d) None of the above.
5. _____ is used for packing dried blood stains.
 - (a) Plastic Zip Lock Bags.
 - (b) Paper Bags.
 - (c) Glass Bottle.
 - (d) Aluminum can.
6. _____ can be identified from the variations in the width of the strokes.
 - (a) Pen Pressure.
 - (b) Pen Lift.
 - (c) Shading.
 - (d) Both (a) and (b).

Turn over

7. Section 45 in The Indian Evidence Act, 1872 deals with :
- (a) Opinions of Experts.
 - (b) Investigation by Experts.
 - (c) Summons to Expert.
 - (d) Examination by Expert.
8. The pattern of the fingerprint in which ridge lines flow inward and return out the same side is
- (a) Whorl.
 - (b) Loop.
 - (c) Arch.
 - (d) Composite.
9. _____ method can develop fingerprint from cloth.
- (a) Black Powder
 - (b) White Powder.
 - (c) Iodine Fuming.
 - (d) Nitrite Fuming.
10. Security of data is ensured by _____ the data.
- (a) Outsourcing.
 - (b) Decrying.
 - (c) Encrypting.
 - (d) Compressing.
11. _____ is a type of malware that downloads onto a computer disguised as a legitimate program.
- (a) Trojan Horse Virus.
 - (b) Worm.
 - (c) Rootkit.
 - (d) RAT.
12. Computers store information as :
- (a) Binary Format.
 - (b) Digital Format.
 - (c) Secondary Format.
 - (d) None of the above.
13. USB stand for :
- (a) Universal Serial Bus.
 - (b) Universal Series Bus.
 - (c) United Serial Bus.
 - (d) Universal Serial Bit.
14. _____ is the practice of hiding one message inside of another.
- (a) Steganography.
 - (b) Cryptography.
 - (c) Calligraphy.
 - (d) Pomography.

15. The settling of blood due to gravity after the heart no longer circulates it through the body is known as :
- (a) Algor Mortis. (b) Livor Mortis.
(c) Cadaveric Spasm. (d) None of the above.
16. _____ are small amounts of blood that detach from the parent stain and splash onto a surface.
- (a) Satellite Droplets. (b) Skeletonized Droplets.
(c) Back Spatter. (d) Voids.
17. Most useful diagnostic tool for identifying animal hairs are :
- (a) Cuticle. (b) Medulla.
(c) Cortex. (d) Scale Patterns.
18. Popular derivative from opium.
- (a) Morphine. (b) Codeine.
(c) THC. (d) Both (a) and (b).
19. MDMA stands for :
- (a) 3,4-Methylenedioxy-Methamphetamine.
(b) 2,3-Methylenedioxy-Methamphetamine.
(c) 4,3-Methylenedioxy-Methamphetamine.
(d) None of the above.
20. _____ cracks will form on the side of the glass opposite to the side of the impact.
- (a) Concentric. (b) Radial.
(c) Multiple. (d) Both (a) and (b).
21. Fuels that are easily vaporized and support combustion, and are highly exothermic are known as :
- (a) Engine Oils. (b) Accelerants.
(c) Combustion. (d) None of the above.

Turn over

22. The diameter of the shotgun barrel is called :
- (a) Gauge.
 - (b) Bore.
 - (c) Rifling.
 - (d) Both (a) and (b).
23. The part of the modern tire that is in contact with the road is called :
- (a) Tread.
 - (b) Groove.
 - (c) Lands.
 - (d) Friction.
24. FIR is :
- (a) First Information Report as per Cr.P.C.
 - (b) First Investigation Report as per Cr. P.C.
 - (c) First Information Report as per IPC.
 - (d) First Investigation Report as per IPC.
25. Section 293 Cr.P.C deals with :
- (a) Reports of certain Government scientific experts.
 - (b) Power to examine the accused.
 - (c) Expert opinion.
 - (d) Exhumation.
26. Which one of the following is not a unit of time ?
- (a) Lunar month.
 - (b) Microsecond.
 - (c) Leap year.
 - (d) Light year.
27. The product of *two* vectors is a :
- (a) Scalar.
 - (b) Vector.
 - (c) May be a vector or a scalar.
 - (d) None of the above.
28. Velocity-time curve for a body projected vertically upward is :
- (a) Straight Line.
 - (b) Parabola.
 - (c) Ellipse.
 - (d) Hyperbola.

29. A mass of 12 kg at rest explodes into two pieces of masses 4 kg and 8 kg which move in opposite direction. If the velocity of 8 kg piece is 6m/s, then the kinetic energy of the other piece is :
- (a) 1.88 Joules. (b) 2.88 Joules.
(c) 3.88 Joules. (d) 4.88 Joules.
30. A particle revolves round a circular path. The acceleration of the particle
- (a) Along the Radius.
(b) Along the Tangent.
(c) Along the circumference of the circle
(d) Zero.
31. Cream gets separated out of milk when it is chumed. This is due to :
- (a) Gravitational force. (b) Frictional force.
(c) Centrifugal force. (d) Centripetal force.
32. The law which governs the working of a spring balance is :
- (a) Robert Hooke's law. (b) Kepler's law.
(c) Newton's law. (d) Thomas Young's law.
33. A gun recoils soon after firing is due to :
- (a) First law of motion. (b) Second law of motion.
(c) Third law of motion. (d) Both (a) and (b).
34. Sound is having maximum velocity in :
- (a) Iron. (b) Air.
(c) Vacuum. (d) Water.
35. In Bernoulli's principle _____ conserved.
- (a) Momentum. (b) Volume.
(c) Mass. (d) Energy.
36. _____ is used to measure the water vapour in atmosphere.
- (a) Thermometer. (b) Hydrometer.
(c) Hygrometer. (d) Rain gauge.

Turn over

37. The first law of thermodynamics is a special case of :
- (a) Charle's Law. (b) Newton's Law.
(c) Law of heat exchange. (d) None of the above.
38. A virtual image larger than the object can be produced by :
- (a) Concave lens. (b) Concave mirror.
(c) Convex mirror. (d) Plane mirror.
39. In the electromagnetic spectrum UV rays comes in between :
- (a) X-rays and visible light. (b) Visible light and IR.
(c) IR and radio waves. (d) Gamma rays and X-rays.
40. Primary colours are :
- (a) Blue, green, yellow. (b) Red, green, blue.
(c) Red, yellow, blue. (d) None of the above.
41. An operator has ten 0.1 ohm resistors. What is the maximum resistance the person can make out of them ?
- (a) 1 Ohm. (b) 10 Ohms.
(c) 5 Ohms. (d) 2 Ohms.
42. What is the density of a cubic block of wood weighing 250 g and 10 cm on each side ?
- (a) 25 g/cm³. (b) 250 g/cm³.
(c) 0.25 g/cm³. (d) 2500 g/cm³.
43. Measure of the bending of a ray of light when passing from one medium into another :
- (a) Refractive index. (b) Diffraction.
(c) Reflection. (d) Reflective index
44. _____ can be used to characterize the structure and elemental composition of polymer layers.
- (a) SEM/EDS. (b) FTIR.
(c) GCMS. (d) TLC.
45. _____ of the microscope selects one particular wavelength to be exposed to the sample.
- (a) Monochromator. (b) Mirror.
(c) Lens. (d) Prism.

46. Frequency is measured in :

- (a) Meter per second. (b) Cycles per second.
(c) Waves per second. (d) Rotation per second.

47. Molecular bonds polarizability is measured by :

- (a) FTIR spectroscopy. (b) Raman spectroscopy.
(c) Gas chromatography. (d) UV-Vis spectroscopy.

48. Internal structure of the specimen is given by :

- (a) SEM. (b) TEM.
(c) FTIR. (d) GC-MS.

49. In the objective lens following marking denotes :

10 × /0.25na

170mm/0.17

- (a) 10 × numerical aperture, 0.25 magnification, 170 mm tube length and 0.17mm cover slip to use.
(b) 10 × tube length, 0.25 cover slip to use, 170 mm numerical aperture and 0.17mm magnification.
(c) 10 × cover slip to use, 0.25 magnification, 170 mm tube length and 0.17mm numerical aperture.
(d) 10 × magnification, 0.25 numerical aperture, 170 mm tube length and 0.17mm cover slip to use.

50. Juxta position of images are seen through :

- (a) Hand lens. (b) Fluorescence microscope.
(c) Comparison microscope. (d) Electron microscope.

51. Emetine is the major alkaloid found in the roots of the plant :

- (a) *Cephaelis Ipecacuanha*. (b) *Derris Elliptica*.
(c) *Solanum Khasianum*. (d) *Azadirachta Indica*.

Turn over

52. Match the following :

- (A) Cocaine
 (B) Quinine
 (C) Reserpine
 (D) Ephedrine

- 1 Cinchona Tree.
 2 *Erythroxylum Coca*.
 3 *Ephedra Equisetina*.
 4 *Rauwolfia Serpentina*.

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

53. Wayanad Wildlife Sanctuary is a part of the _____ biosphere reserve.

- (a) Wayanad. (b) Bandipur.
 (c) Mudumalai. (d) Nilgiri.

54. The green fluorescent protein (GFP) is isolated from :

- (a) *Aequorea Victoria*. (b) *Haematoxylum Campechianum*.
 (c) *Lampyrus Noctiluca*. (d) *Photuris Lucicrescens*.

55. Which one of the following is an example of living fossil ?

- (a) Adiantum. (b) Psilotum.
 (c) Ferns. (d) Selaginella.

56. The Chi-Square test is a statistical hypothesis test commonly used for :

- (a) Testing an association between categorical variables.
 (b) Measuring how a model compares to actual observed data.
 (c) Determine whether there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories.
 (d) All the above.

57. The gradient of ecosystem is called :

- (a) Ecotone. (b) Ecological amplitude.
 (c) Ecocline. (d) Stratification.

58. The biological interaction in which one organism always harmed, but the other is neither harmed nor benefited is called :
- (a) Parasitism. (b) Amensalism.
(c) Mutualism. (d) Commensalism.
59. National Forest Policy was enacted in :
- (a) 1988. (b) 1927.
(c) 1972. (d) 1980.
60. Shannon diversity index accounts for both :
- (a) Species diversity and number.
(b) Species richness and evenness.
(c) Species abundance and geographical area.
(d) Species diversity and climate.
61. An estimation of the total amount of greenhouse gases, mainly carbon dioxide, released into the atmosphere by an individual is called :
- (a) Carbon Trading. (b) Ecotaxes.
(c) Carbon Footprint. (d) Carbon Credit.
62. The article in the Indian Constitution which states Environmental protection in India is a fundamental duty of the citizen of India.
- (a) Article 51-A (g). (b) Article 21-A.
(c) Article 49. (d) Article 50.
63. In vertebrates, antigen presenting cells contains _____ class of MHCs.
- (a) Class I. (b) Class II.
(c) Class III. (d) None.
64. The small, non-immunogenic molecules that elicit an immune response only when attached to a large carrier protein is called :
- (a) Antigens. (b) Epitopes.
(c) Adjuvants. (d) Haptens.

Turn over

65. The strength of multiple interactions with which a multivalent antibody binds to a complex antigen describes :
- (a) Antibody Affinity. (b) Antibody Avidity.
(c) Cross Reaction. (d) Immunization.
66. A tentative statement about the solution of a problem is called :
- (a) Unit. (b) Conclusion.
(c) Abstract. (d) Hypothesis.
67. In a homogenous population, a commonly used sampling method is :
- (a) Random Sampling. (b) Stratified Sampling.
(c) Cluster Sampling. (d) Systematic Sampling.
68. Examples of parametric tests in statistics are :
- (a) Chi-square test, t-test, ANOVA, and linear regression.
(b) Kruskal Willis test, Chi-square test, regression, and Pearson correlation.
(c) t-test, ANOVA, linear regression, and Pearson correlation.
(d) Mann Whitney test, Kruskal Willis test, and Chi-square test.
69. In ethology, the concept of imprinting, a rapid learning process that takes place early in the life of a social animal and establishes a behavior pattern, was introduced by :
- (a) B.F. Skinner. (b) Konrad Lorenz.
(c) Pavlov. (d) Edward L. Thorndike.
70. Theory of chemical evolution was proposed by :
- (a) Francesco Redi. (b) Julian Huxley.
(c) Darwin. (d) Alexander Oparin.
71. Random genetic drift is caused by :
- (A) Small population sizes.
(B) Bottleneck effect.
(C) Founder effect.
(D) Sudden immigration or emigration of individuals.
- (a) A,B and C only. (b) A and D only.
(c) A, B, C and D. (d) B and C only.

72. Match the following :

- (A) Insects
(B) Spiders
(C) Mollusca
(D) Asterias

1. Tube feet.
2. Book lungs.
3. Ctenidia.
4. Trachea.

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

73. Podocytes are the cells found in the :

- (a) Endothelium of Glomerular Capillaries.
(b) Inner wall of Bowman's Capsule.
(c) Outer Cortex.
(d) Loop of Henle.

74. Excessive production of dopamine in the prefrontal cortex is a characteristic feature of :

- (a) Parkinson's disease. (b) Alzheimer's disease.
(c) Schizophrenia. (d) Dementia.

75. Signaling molecules secreted into the extracellular medium that affect the neighbouring cells different types are called :

- (a) Autocrine.
(b) Paracrine.
(c) Endocrine.
(d) Juxtacrine.

76. The buffering agent in the blood that protect from pH change is :

- (a) Iron in Haemoglobin. (b) Serum Proteins.
(c) Plasma Fluid. (d) None.

Turn over

77. A chemical reaction is said to be at equilibrium if :

- (a) Equal amounts of reactants and products are present.
- (b) Rate of forward reaction is equal to backward reaction.
- (c) The product formed is less.
- (d) The reactants are completely transformed into products.

78. Which of the following compound showing a planar configuration ?

- (a) SO_3^{-2} .
- (b) SO^{3-} .
- (c) SO_2Cl_2 .
- (d) SOCl_2 .

79. Number of atoms per body centered cubic unit cell is :

- (a) 4.
- (b) 8.
- (c) 9.
- (d) 12.

80. Electric conductivity of selenium :

- (a) Increases on exposure to light.
- (b) Decreases on exposure to light.
- (c) Remains the same in light.
- (d) First decreases, then increases on exposure to light.

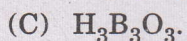
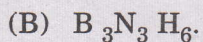
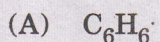
81. Which of the following compound have least dissociation energy ?

- (a) F_2
- (b) Cl_2
- (c) Br_2
- (d) H_2

82. Bleaching mixture is :

- (a) $\text{SO}_2 + \text{Cl}_2$
- (b) Bleaching powder + Cobalt.
- (c) $\text{NaCl} + \text{NaOCl}$.
- (d) $\text{Cl}_2 + \text{ClO}_2$

83. Which of the following compounds are isoelectronic ?



(a) A and B.

(b) A and C.

(c) B and C.

(d) All the above.

84. The role of arsenic in gun powder made of lead is to increase :

(a) Range.

(b) Power.

(c) Strength.

(d) Brittleness.

85. Which of the following elements form $p \Pi - d \Pi$ bonding in oxides ?

(a) Li.

(b) P.

(c) B.

(d) N.

86. Sulphur is extracted from the underground sulphur bearing rocks by :

(a) Bosch Process.

(b) Springs Process.

(c) Frasch Process.

(d) Contact Process.

87. The reaction of NaCl and $K_2Cr_2O_7$ with concentrated H_2SO_4 will form :

(a) CrO_2Cl .

(b) CrO_2Cl_2 .

(c) $CrOCl_3$.

(d) $CrOCl_2$.

88. Super halogen is :

- (a) Cl_2
- (b) F_2
- (c) Br_2
- (d) I_2

89. Semi water gas is :

- (a) $\text{CO} + \text{H}_2$
- (b) $\text{CO} + \text{N}_2$
- (c) $\text{CO} + \text{H}_2 + \text{N}_2$
- (d) $\text{CO} + \text{H}$

90. Which of the following metal can be obtained by leaching its ore with dilute cyanide solution

- (a) Vanadium.
- (b) Zinc.
- (c) Titanium.
- (d) Silver.

91. Galvanising of iron sheets is done by :

- (a) Zn plating.
- (b) Cu plating.
- (c) Ag plating.
- (d) Tin plating.

92. $\text{Zn}(\text{OH})_2$ is :

- (a) Amphoteric.
- (b) Dibasic.
- (c) Monobasic.
- (d) Neutral.

93. Bordeaux mixture is a mixture of lime and
- (a) FeSO_4 .
 - (b) CuSO_4 .
 - (c) AgNO_3 .
 - (d) CuCO_3 .
94. Oxidation state of iron in haemoglobin is :
- (a) + 3.
 - (b) + 4.
 - (c) 0.
 - (d) + 2.
95. The shape of $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$ is :
- (a) Octahedral.
 - (b) Distorted Tetrahedral.
 - (c) Distorted Octahedron.
 - (d) Pentagonal.
96. The insecticide paris green is made of :
- (a) Arsenious Oxide + Copper sulphate + Acetic Acid.
 - (b) Arsenious Oxide + Acetic Acid + Copper Acetate.
 - (c) Stannous Chloride + Copper sulphate + Acetic Acid.
 - (d) Stannous Chloride + Copper Acetate + Acetic acid.
97. The compound $\text{K}_4[\text{Fe}(\text{CN})_6]$ is called :
- (a) Potassium hexacyanoferrate (II).
 - (b) Potassium Ferricyanide.
 - (c) Potassium Hexacyanoferrate (III).
 - (d) Prussian Blue.

Turn over

98. AgCl precipitate dissolves in NH_3 due to the formation of :

- (a) $[\text{Ag}(\text{NH}_4)_2]\text{OH}$.
- (b) $[\text{Ag}(\text{NH}_4)_2]\text{Cl}$.
- (c) $[\text{Ag}(\text{NH}_3)_2]\text{OH}$.
- (d) $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$.

99. Manganese exhibits maximum oxidation in :

- (a) K_2MnO_4 .
- (b) KMnO_4 .
- (c) Mn_3O_4 .
- (d) MnO_2 .

100. Colour in transition metal compounds is due to :

- (a) Small size of Atoms.
- (b) Absorption of UV light.
- (c) Incomplete (n-1)d subshell.
- (d) Complete ns shell.