

MSc(2Yr)(Forensic Science & Criminology)

Note: (i) Question No. 1 to 20 (General Science) compulsory for all.

(ii) Students has to attempt any two portions out of Physics (Question Nos. 21-45), Chemistry (Q. No. 46-70) Biology (Q. No. 71-95) and Forensic Science (Q. No. 96-120).

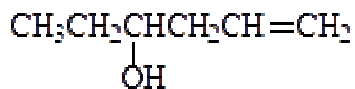
1. Benedict solution is used for the test of
A) Reducing agents
B) Oxidizing sugars
C) Reducing sugars
D) Oxidizing agents
2. The central metal of chelate compound 'Chlorophyll' is
A) Mg
B) Cu
C) Fe
D) Mn
3. Phenomenon explaining spreading of ink in water is
A) Dipole movement
B) Diffusion
C) Solute kinetics
D) Osmosis
4. Ascorbic acid is
A) Vitamin A
B) Vitamin D
C) Vitamin C
D) Vitamin E
5. Malaria control suggests spraying oil on stagnant water. Why?
A) Mosquito larva cannot breath
B) Malaria parasites are killed by oil layer
C) Surface tension of water changes
D) Mosquito eggs are rumped
6. Fuel efficiency is expressed as
A) Calorimetric value
B) Octane value
C) Calorific value
D) Fuel specific value
7. What is the major contributing component of acid rain?
A) Oxides of Sulphur and Nitrogen
B) Hydroxides of Phosphorus and Magnesium
C) Oxides of Calcium and Magnesium
D) Hydroxide of Phosphorus and Nitrogen
8. Which radioactive element is generally present in humans?
A) Cobalt-60
B) Iodine-131
C) Potassium-40
D) Beryllium-3
9. Sebum is related to
A) Pituitary
B) Skin
C) Liver
D) GIT
10. The instrument to detect and measure earthquakes is called
A) Seismograph
B) Richter scale
C) Technograph
D) Bolometer
11. Simultaneous cycles of heating and pressure turn existing rocks into
A) Igneous
B) Metamorphic
C) Sedimentary
D) Plutonic

12. Which of the following is the effective extinguisher for all confined fires?
 A) CO_2 B) NO_2 C) SO_2 D) N_2O
13. The type of combustion where a material suddenly bursts into flames, without application of any apparent cause is called
 A) Rapid combustion B) Explosion
 C) Automated combustion D) Spontaneous combustion
14. In agriculture the process of loosening and turning of soil is called
 A) Drilling B) Cultivating C) Tilling D) Shearing
15. Which process portrays the excretion in Amoeba?
 A) Diffusion B) Infusion C) Uricotelic D) Transport
16. Which of the following metals forms amalgam with other metals?
 A) Aluminium B) Copper C) Mercury D) Chromium
17. Sodium metal being very reactive, is preserved in
 A) Alcohol B) Kerosene C) Water D) Acetone
18. Disease carrying agents are called
 A) Pathogens B) Vectors C) Microorganisms D) Microbes
19. Epoxy resins are very effective
 A) Insecticides B) Cement precursor C) Adhesives D) Deliriant
20. Chemically 'soaps' are
 A) Glycerol and fatty acids B) Sodium/Potassium salts of fatty acids
 C) Esters of fatty acids D) Glycerine and fatty acids
21. If, ultrasonic, infrasonic and audible waves travel through a medium with speeds v_u , v_i , v_a respectively, then
 A) v_u , v_i , v_a are nearly equal B) $v_u \geq v_a \geq v_i$
 C) $v_u \leq v_a \leq v_i$ D) $v_a \leq v_u$ and $v_u \leq v_i$
22. The equation of displacement of two waves are given as $y_1 = 10 \sin\left(3\pi t + \frac{\pi}{3}\right)$ and $y_2 = 5(\sin 3\pi t + \sqrt{3} \cos 3\pi t)$ then, what is the ratio of their amplitudes
 A) 1:2 B) 2:1 C) 1:1 D) None
23. A simple harmonic motion having an amplitude A and time period T is represented by the equation $y = 5 \sin \pi(t + 4)$ m then the values of (A in m) and (T in sec) are
 A) A = 5, T = 2 B) A = 10, T = 1 C) A = 5, T = 1 D) A = 10, T = 2
24. The impedance of a series RLC circuit is 8 ohm, when $\nu = 60\text{Hz}$ at resonance and 10 ohm at 80 Hz. Calculate the value of L & C.
 A) 2.7H, 2.6F B) 0.0261H, 0.00027F
 C) 26H, 2.7F D) 0.00261H, 0.0027F

25. On the surface of the lake floats two pieces of wood, the distance between them is 6 m. The waves propagate on the surface of the lake. When the first wood has moved up and down three times, the second wood just moved up and down one time. If every 2 seconds both kinds of wood move up and down three times, the wave propagation is
 A) 2.0 m/s B) 3.0 m/s C) 1.5 m/s D) 4.5 m/s
26. On a rope propagates a wavelength rope with a frequency of 50 Hz and a wavelength of 2 m. Period and velocity of the wave are
 A) 0.02 seconds and 50 ms^{-1} B) 0.02 seconds and 100 ms^{-1}
 C) 0.04 seconds and 50 ms^{-1} D) 0.5 seconds and 100 ms^{-1}
27. What will happen to a glass rod immersed in a liquid of the same refractive index? It will
 A) Appear bent B) Look longer C) Disappear D) Appear short
28. The ratio of path length and the respective time interval is
 A) Mean velocity B) Mean speed
 C) Instantaneous velocity D) Instantaneous speed
29. The idea of Quantum nature of light has emerged in an attempt to explain
 A) Interference B) Diffraction
 C) Polarization D) Radiation spectrum of black body
30. A spaceship is receding from earth at a speed of $0.21 c$. A light from the spaceship appears as yellow ($\lambda = 589.3 \text{ nm}$) to an observer on earth. What would be its color as seen by the passenger of the spaceship?
 A) Green B) Blue C) White D) Grey
31. The oscillator has
 A) Positive feedback B) Negative feedback
 C) No feedback D) Both type of feedback
32. In nuclear fusion 0.1% mass is converted into energy. The energy released by the fusion of 1 kg mass will be
 A) $9 \times 10^{16} \text{ J}$ B) $9 \times 10^{19} \text{ J}$ C) $9 \times 10^{13} \text{ J}$ D) $9 \times 10^{17} \text{ J}$
33. The branch of classical mechanics dealing with motion without considering its cause is known as
 A) Kinematics B) Dynamics C) Hydrodynamics D) Mechanics
34. If a positive point charge is placed outside a neutral conducting sphere, what will be the charge on the sphere?
 A) Negative and distributed uniformly over the surface of the sphere
 B) Negative and appears only at the point on the sphere closest to the point charge
 C) Negative and distributed non-uniformly over the entire surface of the sphere
 D) Zero

35. A converging lens is used to form an image on a screen. When the upper half of the lens is covered by an opaque screen:
- A) Half of the image will disappear B) Image will not form on the screen.
C) Intensity of image will increase D) Intensity of image will decrease
36. The Helmholtz free energy function is defined as
- A) $F = U + TS$ B) $F = U - TS$ C) $F = U + PV$ D) $F = U + PV - TS$
37. The neutral temperature of Cu-Fe thermocouple is 270°C . If the temperature of cold junction is 30°C , the temperature of inversion will be
- A) 510 K B) 510°C C) 300 K D) 300°C
38. If kinetic energy of free electron is made double, change in De-Broglie wavelength will be
- A) $\sqrt{2}$ B) $\frac{1}{\sqrt{2}}$ C) 2 D) $\frac{1}{2}$
39. In circular coil when number of turns is doubled and resistance becomes half of the initial then inductance becomes
- A) 4 times B) 2 times C) 8 times D) No change
40. A block of mass m is placed on a smooth inclined plane of inclination θ . What will be the magnitude of the force exerted on the block by the plane?
- A) mg B) $mg/\cos\theta$ C) $mg\tan\theta$ D) $mg\cos\theta$
41. In Fraunhofer diffraction, the incident wave front is
- A) Plane B) Spherical C) Cylindrical D) Circular
42. The band gap energy of CuO is
- A) 0 eV B) 0.7 eV C) 0.08 eV D) 2.1 eV
43. The electronic contribution to the specific heat of a metal at low temperature is proportional to
- A) T B) T^2 C) T^3 D) T^4
44. Technetium-99 ($^{99}\text{Tc}_{43}$) has an excited state that decays by emission of a gamma ray. The half-life of the excited state is 360 min. What is the activity, in curies, of 1.00 mg of this excited isotope?
- A) $1.95 \times 10^{14}\text{Bq}$ B) $3.95 \times 10^{-14}\text{Bq}$ C) $3.95 \times 10^{14}\text{Bq}$ D) $1.95 \times 10^{-14}\text{Bq}$
45. Knee voltage of Si (silicon) diode is
- A) 0.3V B) 1.1V C) 0.7V D) 1.43V
46. Which of the following orbital is not possible?
- A) 1s B) 2s C) 2p D) 3f
47. How many orbitals are there in f and g subshell?
- A) 6, 8 B) 7, 9 C) 7, 11 D) 9, 11

48. Which of the following is not a hard base?
 A) NH_3 B) H_2O C) Cl^- D) CN^-
49. The correct order of acidic character of hydro acid of group VII is
 A) $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$ B) $\text{HI} > \text{HBr} > \text{HF} > \text{HCl}$
 C) $\text{HF} > \text{HBr} > \text{HCl} > \text{HI}$ D) $\text{HI} > \text{HF} > \text{HBr} > \text{HCl}$
50. What is % ionic character of C-Cl bond in CCl_4 if the electro negativities of C and Cl are 3.5 and 3.0 respectively?
 A) 8.875% B) 7.675% C) 7.689% D) 8.867%
51. Lattice energy of a solid increases if
 A) The ion are large B) The ion are small
 C) The ions are of equal size D) Charge on the ions are small
52. Which of the following molecules is not tetrahedral?
 A) CF_4 B) SF_4 C) CH_4 D) SiF_4
53. The bond order in superoxide (O_2^-) ion is
 A) 2 B) 2.5 C) 1.5 D) 3
54. During oxidation process electrons are:
 A) Gained B) Paired up C) At same state D) Lost
55. The process of heating the concentrated ore in a limited supply of air or in the absence of air is known as:
 A) Roasting B) Leaching C) Calcination D) Cupellation
56. Which one of the following Vitamins is essential for coagulation of Blood?
 A) K B) C C) A D) B1
57. Which transitions are studied by UV spectrometer?
 A) Rotational B) Electronic C) Nuclear D) Vibrational
58. Average kinetic energy per molecule of gases is
 A) $(3/2)kT$ B) $(3/2)RT$ C) $(1/2)kT$ D) $(1/2)RT$
59. For one mole of gas C_p and C_v relations are:
 A) $C_v = C_p + R$ B) $C_p = C_v - R$ C) $C_p = C_v + R$ D) $C_v = C_p - R$
60. The cell in which chemical energy is converted to electrical energy is:
 A) Galvanic cell B) Voltaic cell
 C) Electrolytic cell D) Electrochemical cell
61. Sea water can be converted into fresh water by:
 A) Osmosis B) Sedimentation C) Diffusion D) Reverse Osmosis
62. The correct IUPAC name for the following structure is.



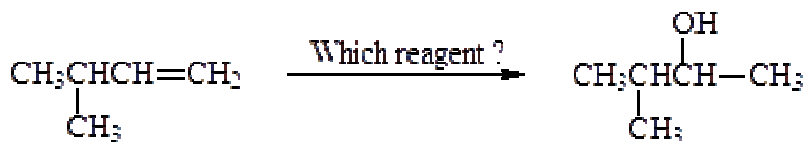
A) 5-hexen-3-ol

B) 1-hexen-4-ol

C) 3-hydroxy-5-hexene

D) Isohexen-3-ol

63. Which is the best reaction sequence to use if one wants to accomplish an alcohol synthesis shown below?



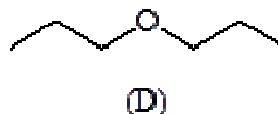
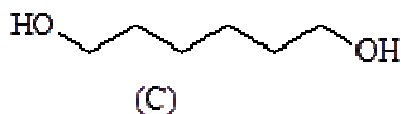
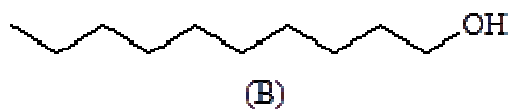
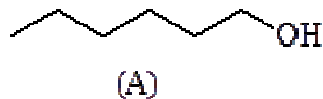
A) NaOH/H₂O

B) KMnO₄/H₂O

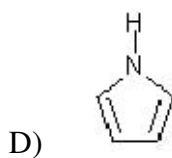
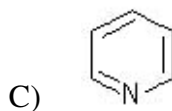
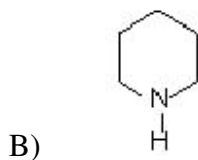
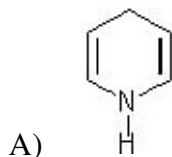
C) i) Hg(OAc)₂/H₂O ii) NaBH₄

D) i) BH₃ ii) H₂O₂/HO⁻

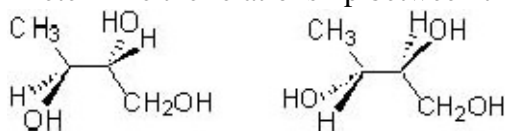
64. Which of the following compounds is expected to have the greatest solubility in water?



65. Which of the following amines is pyridine?



66. Determine the relationship between the two molecules shown below



- A) Constitutional isomers
 B) Enantiomers
 C) Diastereomers
 D) Identical molecules
67. A strong signal at 1700 cm^{-1} in an IR spectrum indicates the presence of
- A) Alcohol
 B) Ether
 C) Carbonyl
 D) Amine
68. Which of the following cycloalkanes has the MOST strain energy?
- A) Cyclobutane
 B) Cyclopentane
 C) Cyclohexane
 D) Cycloheptane
69. Which of the following does NOT increase the reaction rate by affecting the number or nature of collisions?
- A) Increasing the pressure
 B) Increasing the surface area
 C) Increasing the temperature
 D) Catalyst
70. Among F^- , Na^+ , O^{2-} and Mg^{2+} ions, those having the highest and the lowest ionic radii respectively are;
- A) O^{2-} and Na^+
 B) F^- and Mg^{2+}
 C) O^{2-} and Mg^{2+}
 D) Mg^{2+} and O^{2-}
71. A plant cell that is placed in an isotonic solution will
- A) Gain more water
 B) Lose water
 C) Remain as such
 D) Inflate
72. In which of the following processes the CO_2 is liberated?
- A) Ascent of sap
 B) Photosynthesis
 C) Respiration
 D) Transpiration
73. Which of the sequence of atoms can be found in the backbones of polypeptides?
- A) C-N-N-C
 B) C-C-C-N
 C) C-C-N-C
 D) N-C-C-C
74. Sleeping movements of leguminous plants are called
- A) Nastic
 B) Tropical
 C) Twining
 D) Winding
75. Doctrine of evolution is concerned with
- A) Special creation theory
 B) Abiogenesis
 C) Gradual changes
 D) Biogenesis
76. A thick walled spore meant for perennation is called as
- A) Aplanospore
 B) Hyphospores
 C) Hypospores
 D) Akinete
77. Which of the following is the best indicator of SO_2 pollution
- A) Pinus
 B) Lichens
 C) Fern
 D) Algae

78. The sensory receptors for 'pain' are called as

A) Mechanoreceptors	B) Pacinian receptors
C) Perifollicular cells	D) Nociceptors
79. The successive nucleotides of DNA are covalently linked through:

A) Phosphodiester bond	B) Glycosidic bond
C) Hydrogen bond	D) Ionic bond
80. In the cell cycle, mitosis occurs between which two phases?

A) G1 and S phase	B) S and G1 phase
C) S and G2 phase	D) G1 and G2 phase
81. In two dimensional electrophoresis proteins are separated:

A) Initially by mass and then by charge	B) On the basis of charge
C) On the basis of mass	D) Initially by charge and then by mass
82. The smallest RNA is

A) Transfer RNA	B) Messenger RNA
C) Ribosomal RNA	D) Chromosomal RNA
83. Osmosis is a form of diffusion in which:

A) Solute moves freely from a region of higher concentration to lower concentration through semi-permeable membrane
B) Solvent moves through a semi-permeable membrane from a region, where a solute is in higher concentration to region of lower concentration
C) Solvent moves through a semi-permeable membrane from a region, where a solute is in lower concentration to region of higher concentration
D) Solute moves freely down the concentration gradient
84. In ovary the progesterone and estrogen are secreted by

A) Corpus callosum and Granulosa cells
B) Corpus delicti and Graafian follicles
C) Corpus albicans and Graafian follicles
D) Corpus luteum and Granulosa cells
85. Hepatic portal system takes blood from

A) Gastrointestinal tract to liver	B) Kidney to liver
C) Heart to liver through kidney	D) Brain through heart to liver
86. Bottom dweller animals are known as

A) Arboreal	B) Benthos	C) Abyssal	D) Producers
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87. Tight junctions

A) Are essential for metabolic coupling
B) Do not occur in vertebrates
C) Have the closest approach of two plasma membranes of any junction

D) Surround connexons

88. Satellite DNA is:

- A) Extra chromosomal DNA
- B) Ribosomal RNA genes
- C) Single gene region
- D) Short repetitive nucleotide sequences

89. The vascular bundle having xylem and phloem at the same radius is termed as

- A) Collateral
- B) Concentric
- C) Lipocentric
- D) Amphicribal

90. What is the distance between the two DNA base pairs?

- A) 34 Å
- B) 3.4 Å
- C) 24 Å
- D) 2.4 Å

91. Which of the following is Sex linked inheritance?

- A) Cretinism
- B) Anaemia
- C) Color blindness
- D) Gigantism

92. Which of the following is the connecting link between reptiles and birds?

- A) Dimetrodon
- B) Dodo
- C) Archaeopteryx
- D) Sphenodon

93. Fluid mosaic model of cell membrane was given by:

- A) Beadle and Tatum
- B) Singer and Nicholson
- C) Watson and Crick
- D) Robertson and Miller

94. The plants growing in shifting sand are called

- A) Lithophytes
- B) Halophytes
- C) Chasmophytes
- D) Psammophytes

95. Empty glumes are called

- A) Petals
- B) Bracts
- C) Carpels
- D) Stamens

96. LSD is derived from

- A) Alcohol
- B) Bacteria
- C) Fungus
- D) 2,4-DS

97. Coronal suture may begin to fuse by the age of

- A) 24 yrs
- B) 30 yrs
- C) 38 yrs
- D) 48 yrs

98. **Rigor mortis first evident in**

- A) Intestine
- B) Myocardium
- C) Interstitial muscle
- D) **Eyelids**

99. Universal charcoal essentially contains two parts of

- A) Magnesium oxide
- B) Activated animal charcoal
- C) Tannic acid
- D) Magnesium phosphate

100. "Paradox" gun is associated with

- A) Revolver
- B) Automatic pistol
- C) Shotgun
- D) Machine gun

- 101. Which section of IPC defines 'Rape'?**
A) 375 B) 376 C) 376A D) 377
- 102. What is source of nuclear DNA from blood?**
A) Plasma B) Platelets C) Erythrocytes D) Leucocytes
- 103. Heroin is obtained by treating morphine with**
A) Acetic anhydride B) Ethanol C) Ester D) Diethyl ether
- 104. Which is the least common fingerprint pattern?**
A) Loop B) Whorl C) Arch D) Composite
- 105. Restoration of erase number on metallic surface can be done by**
A) Metallic Brushing B) Filing
C) Soft hammering D) Chemical itching
- 106. Who is the father of Forensic Toxicology?**
A) Mathieu Orfila B) Karl Landsteiner
C) Meille Mathieu D) Wiener Landsteiner
- 107. Which poison can be detected in the bones even long after death?**
A) Mercury B) Arsenic C) Antimony D) Lead
- 108. Which is the most common substance of abuse in India?**
A) Cannabis B) Opium C) Alcohol D) Tobacco
- 109. The impression on the road appearing when tyre of vehicle move without revolving is called**
A) Tyre mark B) Friction mark C) Contact marks D) Skid marks
- 110. The fusion of diaphysis and both the epiphysis together is called**
A) Epiphyseal closure B) Brow ridge
C) Epicondyl D) Sciatic notch
- 111. Which is the best site from where diatoms can be obtained in dumped drowning ?**
A) Bone marrow of radius B) Liver
C) Lungs D) Bone marrow of femur
- 112. How much 'ounce' is 'dram equivalent' equal to**
A) 1/24 of ounce B) 1/16 of ounce C) 1/32 of ounce D) 1/8 of ounce
- 113. Which of the following is a regenerated fiber?**
A) Nylon B) Orlon C) Acrylic D) Rayon

114. Pearson's formula in anthropology is used to calculate
A) Stature B) Crural index C) Age D) Craniometric index
115. IR spectrum of any molecules is also called as
A) Finger print B) Identification mark
C) Bond marker D) Transmittance mark
116. The fourth component of fire tetrahedron, other than heat, fuel and oxygen is
A) Energy B) Oxidiser C) Substrate D) Chain reaction
117. What does the Section 29C CrPC depicts?
A) Investigating officer Report B) Government scientific experts Report
C) Police officer Report D) Public dealing officer Report
118. What is the major component of single base smokeless powder?
A) Insoluble Nitroglycerine B) Insoluble Nitroglycerine
C) Insoluble Nitrocellulose D) Soluble Nitrocellulose
119. Heat resistant Pyrex glass is an example of
A) Borosilicate glass B) Aluminosilicate glass
C) Lead-oxide glass D) Fused-silica glass
120. Cheiloscopy is the study of
A) Finger prints B) Lip prints C) Foot prints D) Palate prints