MOCK TEST PAPER 1

Time : 3 hours **Max. Marks : 720**

Important Instructions:

1. *There are 200 questions in this test and you have to attempt only 180 questions. Each question carries 4 marks. For each correct response, the candidates will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.*
2. *There are 4 subjects in the test and each subject has 2 sections: Section A and B. Section A has 35 questions and all are compulsory, while Section B has 15 questions and you have a choice to attempt only 10 questions.*
3. *Each question caries 4 marks. For each correct response, the candidate will get 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered/Unattempted questions will be given no marks.*
4. *Use Blue/Black Ball point pen any for writing particulars on this page/marking responses.*
5. *Use of Electronic/Manual calculator is prohibited.*

PHYSICS

Section A

1. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and the 25th division of the circular scale coincides with the reference level of the main scale. If screw gauge has a zero error of –0.004 cm, the correct diameter of the ball is:
(a) 0.521 cm **(b)** 0.529 cm **(c)** 0.053 cm **(d)** 0.525 cm

2. A simple pendulum of period T has a metal bob which is negatively charged. If it is allowed to oscillate above a positively charged metal plate, its period will:
(a) Remain equal to T **(b)** Be less than T
(c) Be greater than T **(d)** Be infinite

3. A specimen of silicon is to be made p-type semiconductor. For this one atom of indium, on an average, is doped in 5×10^7 silicon atoms. If the number density of silicon is 5×10^{28} atoms/m^2, then the number of acceptor atoms per cm^3 will be:
(a) 2.5×10^{30} **(b)** 1.0×10^{13}
(c) 1.0×10^{15} **(d)** 2.5×10^{36}

4. A person of mass 60 kg is inside a lift of mass 940 kg and presses the button on control panel. The lift starts moving upwards with acceleration 1.0 ms^{-2}. If $g = 10$ ms^{-2}, the tension in the supporting cable is:
(a) 8600 N **(b)** 9680 N **(c)** 11000 N **(d)** 1200 N

5. At constant volume, temperature of a cylinder is increased then:
(a) Collision on walls will be less
(b) Collision frequency will increase
(c) Collision will be in straight line
(d) Collision will not change

6. A parallel beam of monochromatic light of wavelength 5000 Å is incident normally on a single narrow slit of width 0.001 mm. The light is focused by a convex lens on a screen placed on the focal plane. The first minima will be formed for the angle of diffraction equal to
(a) 0° **(b)** 15° **(c)** 30° **(d)** 60°

7. The acceleration due to gravity on planet A is 9 times the acceleration due to gravity on planet B. A man jumps to a height of 2 m on the surface of planet A. What is the height of the same jump on planet B?
(a) 18 m **(b)** 6 m **(c)** $\frac{2}{3}$ m **(d)** 219 m

8. A particle is executing SHM along a straight line. Its velocities at distances x_1 and x_2 from the mean position are v_1 and v_2, respectively. Its time period is:
(a) $2\pi\sqrt{\frac{(x_1^2 + x_2^2)}{(v_1^2 + v_2^2)}}$ **(b)** $2\pi\sqrt{\frac{(x_2^2 - x_1^2)}{(v_1^2 + v_2^2)}}$
(c) $2\pi\sqrt{\frac{(x_2^2 - x_1^2)}{(v_1^2 - v_2^2)}}$ **(d)** $2\pi\sqrt{\frac{(v_1^2 - v_2^2)}{(x_1^2 - x_2^2)}}$

9. A polarizer is used to
(a) reduce intensity of light.
(b) produce polarized light.
(c) increase intensity of light.
(d) produce unpolarized light.

10. The wet-ability of a surface by a liquid depends primarily on:
(a) Density
(b) Angle of contact between surface and liquid
(c) Viscosity
(d) Surface tension

11. A small object of uniform density rolls up a curved surface with an initial velocity "v". It reaches up to a maximum height of $3v^2/4g$ with respect to the initial position. The object is:
(a) Solid sphere **(b)** Hollow sphere
(c) Disc **(d)** Ring

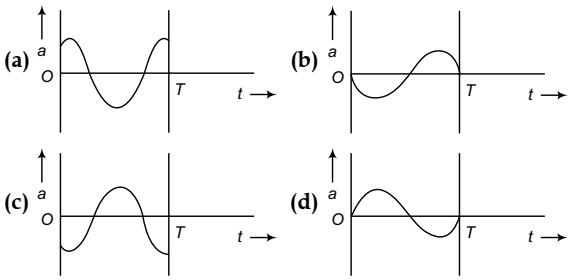
12. A physical quantity of the dimension of length that can be formed out of c, G and $\frac{e^2}{4\pi\varepsilon_0}$ is: [c is velocity of light, G is universal constant of gravitation, e is charge]

(a) $e^2\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$ **(b)** $\frac{1}{c^2}\left[\frac{e^2}{G4\pi\varepsilon_0}\right]^{1/2}$

(c) $\frac{1}{c}G\frac{e^2}{4\pi\varepsilon_0}$ **(d)** $\frac{1}{c^2}\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

13. The oscillation of a body on a smooth horizontal surface is represented by the equation X = A cos (ωt), where X = displacement at time and t, and ω = frequency of oscillation.

Which one of the following graph shows correctly variation of 'a' with 't'?



14. A plane polarised light coming out of a polarizer with intensity I_0 enters an analyser kept at an angle of 45° with the polarizer. What will be the intensity of the light coming out of the analyser?

(a) I_0 **(b)** $\frac{I_0}{2}$ **(c)** $\frac{I_0}{4}$ **(d)** Zero

15. Three sound waves of equal amplitudes have frequencies $(n-1)$, n, $(n+1)$. They superimpose to give beats. The number of beats produced per second will be:

(a) 1 **(b)** 4 **(c)** 3 **(d)** 2

16. The isothermal elasticity of a gas is equal to:

(a) Density **(b)** Volume

(c) Pressure **(d)** Specific heat

17. If the dimensions of a physical quantity are given by $[M^aL^bT^c]$, then the physical quantity will be:

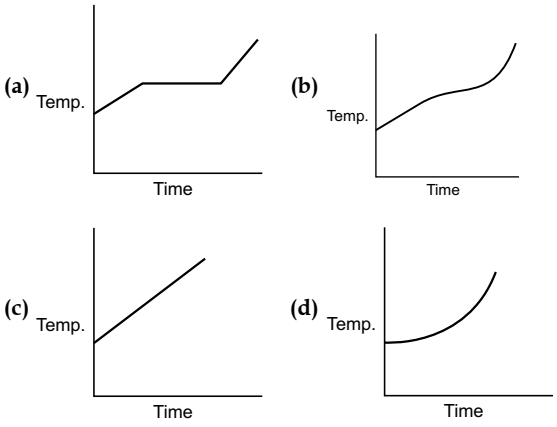
(a) Force **if,** $a = 0, b = -1, c = -2$

(b) Pressure **if,** $a = 1, b = -1, c = -2$

(c) Velocity **if,** $a = 1, b = 0, c = -1$

(d) Acceleration **if,** $a = 1, b = 1, c = -2$

18. Liquid oxygen at 50 K is heated to 300 K at constant pressure of 1 atm. The rate of heating is constant. Which one of the following graphs represents the variation of temperature with time?



19. Velocity of light in glass whose refractive index with respect to air is 1.5 is 2×10^8 m/s. Also in certain unknown liquid the velocity of light is found to be 2.5×10^8 m/s. The refractive index of the liquid with respect to air is

(a) 0.64 **(b)** 0.80 **(c)** 1.20 **(d)** 1.44

20. A semi-conducting device is connected in a series circuit with a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to almost zero. The device may be:

(a) A p-n junction

(b) An intrinsic semi-conductor

(c) A p-type semi-conductor

(d) An n-type semiconductor

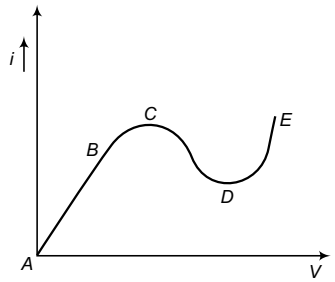
21. The electric potential at a point on the axis of an electric dipole depends on the distance r of the point from the dipole as:

(a) $\propto 1/r$ **(b)** $\propto 1/r^2$ **(c)** $\propto r$ **(d)** $\propto 1/r^3$

22. A long wire carrying a steady current is bent into a circular loop of one turn. The magnetic field at the centre of the loop is B. It is then bent into a circular coil of n turns. The magnetic field at the centre of this coil of n turns will be:

(a) nB **(b)** n^2B **(c)** $2n$B **(d)** $2n^2$B

23. From the graph between current i and voltage V shown below, identify the portion corresponding to negative resistance:



(a) DE **(b)** CD **(c)** BC **(d)** AB

24. Workdone in increasing the size of a soap bubble from radius of 3 cm to 5 cm is nearly (surface tension of soap solution = 0.03 Nm^{-1})

(a) 0.2π mJ **(b)** 2π mJ **(c)** 0.4π mJ **(d)** 4π mJ

25. A particle of mass m is moving with a uniform velocity v_1. It is given an impulse such that its velocity becomes v_2. The impulse is equal to:

(a) $m[|v_2| - |v_1|]$ **(b)** $\frac{1}{2}[v_2^2 - v_1^2]$

(c) $m[v_2 + v_1]$ **(d)** $m[v_2 - v_1]$

26. A certain metallic surface is illuminated with monochromatic light of wavelength, λ. The stopping potential for photoelectric current for this light is $3V_0$. If the same surface is illuminated with light of wavelength 2λ, the stopping potential is V_0. The threshold wavelength for this surface for photoelectric effect is:

(a) λ/4 **(b)** λ/6 **(c)** 6λ **(d)** 4λ

27. A sound of wavelength λ travelling in a medium with a speed of v m/s enters into another medium where its speed is $2v$ m/s. Wavelength of the sound wave in the second medium is

(a) λ **(b)** λ/2 **(c)** 2 λ **(d)** 4 λ

28. A man is sitting with folded hands on a revolving table. Suddenly, he stretches his arms, Angular speed of the table would:

(a) Increase **(b)** Decrease

(c) Remain the same **(d)** Nothing can be said

29. A set of 'n' equal resistors, of value 'R' each, are connected in series to a battery of emf 'E' and internal resistance 'R'. The current drawn is I. Now, the 'n' resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10I. The value of 'n' is:
(a) 20 **(b)** 11 **(c)** 10 **(d)** 9

30. Water with a mass of 2.0 kg is held at constant volume in a container while 10.0 kJ of energy is slowly added by a flame. The container is not well insulated, and as a result 2.0 kJ of energy leaks out to the surroundings. What is the temperature of water?
(a) 0.28°C **(b)** 27°C **(c)** 0.96°C **(d)** 1.27°C

31. Which of the following statements is true about the indicator diagram of adiabatic and isothermal processes?
(a) The slope of isothermal is more than that of adiabatic.
(b) The slope of adiabatic is more than that of isothermal.
(c) Both are parallel straight lines.
(d) Both are parallel curves.

32. **Statement I**: A car is moving in a horizontal circular plane with varying speed, then the net frictional force is neither pointing towards the radial direction nor along the tangential direction.
Statement II: Components of the frictional force are providing the necessary tangential and centripetal acceleration, in the above situation.
(a) Statement I is true, Statement II is true and Statement II is the correct explanation of Statement I
(b) Statement I is true, Statement II is true, but Statement II is not the correct explanation of Statement I
(c) Statement I is true, Statement II is false
(d) Statement I is false, Statement II is true

33. Through which character we can distinguish the light waves from sound waves:
(a) Interference **(b)** Refraction
(c) Polarization **(d)** Reflection

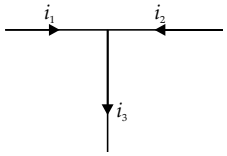
34. In a p-n junction diode, change in temperature due to heating:
(a) Does not affect resistance of p-n junction
(b) Affects only forward resistance
(c) Affects only reverse resistance
(d) Affects the overall V-I characteristics of P-N junction

35. A charged pendulum bob is oscillating in a region influenced by the gravitational and electrostatic field. The two fields are anti parallel to each other. The charge on the bob is negative. If the electric field is switched off the time period of small oscillations of the pendulum will:
(a) Increase
(b) Decrease
(c) Remain unchanged
(d) Depends on the magnitudes of the field

Section B

36. A light string passing over a smooth light pulley connects two blocks of masses m_1 and m_2 (vertically). If the acceleration of system is $\frac{g}{8}$, then the ratio of masses is:
(a) 8 : 1 **(b)** 9 : 7 **(c)** 4 : 3 **(d)** 5 : 3

37. If $i_1 = 3 \sin \omega t$ and $i_2 = 4 \cos \omega t$, then i_3 is:



(a) 5 sin (ωt + 53°) **(b)** 5 sin (ωt + 37°)
(c) 5 sin (ωt + 45°) **(d)** 5 cos (ωt + 53°)

38. A car of mass 1600 kg negotiates a banked curve of radius 160 m on a frictionless road. If the banking angle is 45°, the speed of the car is:
(a) 45 m/s **(b)** 40 m/s **(c)** 20 m/s **(d)** 80 m/s

39. The speed of a homogenous solid sphere after rolling down an inclined plane of vertical height h from rest without sliding is:
(a) $\sqrt{10gh/7}$ **(b)** $\sqrt{gh}$
(c) $\sqrt{6gh/5}$ **(d)** $\sqrt{4gh/3}$

40. A charge of 40 μC is given to a capacitor having capacitance C = 10 μF. The stored energy in ergs is:
(a) 80×10^{-6} **(b)** 800 **(c)** 80 **(d)** 8000

41. A car moving at a speed of 72 km/hr can be stopped in a distance of 40 m after brakes are pressed. If the same car is moving at a speed of 144 km/hr then after how much distance it will stop after braking?
(a) 80 m **(b)** 160 m **(c)** 200 m **(d)** 240 m

42. If two balls are projeted at angles of 45° and 60° and the maximum heights reached are same, what is the ratio of initial velocities?
(a) 2 : 3 **(b)** 3 : 2 **(c)** $\sqrt{2} : \sqrt{3}$ **(d)** $\sqrt{3} : \sqrt{2}$

43. In which of the following cases the potential energy is defined
(a) non-conservative forces only
(b) conservative forces only
(c) both conservative and non-conservative forces
(d) none of these

44. A current of 4×10^{-3} A is flowing in a long straight conductor. The value of line integral of magnetic field around the closed path enclosing the straight conductor will be
(a) $1.6\pi \times 10^{-9}$ Wbm^{-2} **(b)** 1.6×10^{-9} Wbm^{-2}
(c) 1.6×10^{-9} Wbm^{-2} **(d)** $1.6\pi \times 10^{-7}$ Wbm^{-2}

45. The magnetic flux across a loop of resistance 10 Ω is given by $10t^2 - 8t + 6$ Wb. How much current is induced in the loop after 2s?
(a) 3.2 A **(b)** 2.2 A **(c)** 4.2 A **(d)** 1.2 A

46. An alternating voltage source is connected in series with a resistor R and an inductor L. If the potential drop across resistor is 120 V and across inductor is 50 V then the supply voltage is
(a) 170 V **(b)** 70 V **(c)** 130 V **(d)** 110 V

47. Voltage and current in AC circuit are given by V = 10 sin $\left(50\pi t - \frac{\pi}{6}\right)$ and I = 4 sin $\left(50\pi t + \frac{\pi}{6}\right)$
(a) Voltage leads the current by 60°
(b) Voltage leads the current by 30°
(c) Current leads the voltage by 30°
(d) Current leads the voltage by 60°

48. The acceleration of electron in the first orbit of hydrogen atom is
(a) $\frac{4\pi^2 m}{h^3}$ **(b)** $\frac{h^2}{4\pi^2 mr}$ **(c)** $\frac{h^2}{4\pi^2 m^2 r^3}$ **(d)** $\frac{m^2 h^2}{4\pi^2 r^3}$

49. How many revolutions does an electron makes in the first Bohr orbit in one second?
(a) 1.33×10^{16} **(b)** 6.57×10^{16}
(c) 1.54×10^{16} **(d)** 6.57×10^{15}

50. In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of 2×10^{10} Hz with amplitude of 48 Vm^{-1}. The wavelength of wave is
(a) 24×10^{-10} m **(b)** 24×10^{8} m
(c) 1.5×10^{8} m **(d)** 1.5×10^{-2} m

CHEMISTRY

Section A

51. A mixture of gases contains H_2 and O_2 gases in the ratio of 1 : 4 (w/w). What is the molar ratio of the two gases in the mixture?
(a) 16 : 1 **(b)** 2 : 1 **(c)** 1 : 4 **(d)** 4 : 1

52. In H-atom spectrum electron jumps from 5th excited state to 1st excited state then total number of spectral lines, number of lines in Lyman series and Paschen series respectively are:
(a) 10, 4, 3 **(b)** 15, 0, 4 **(c)** 15, 4, 5 **(d)** 10, 0, 3

53. The angular momentum of electron in '*d*' orbital is equal to:
(a) $2\sqrt{3}h$ **(b)** h **(c)** $\sqrt{6}h$ **(d)** $\sqrt{2}h$

54. Which of the following is correct with respect to –I effect of the substituents? [R = alkyl]
(a) $-NH_2 > -OR > -F$ **(b)** $-NR_2 < -OR < -F$
(c) $-NH_2 < -OR < -F$ **(d)** $-NR_2 > -OR > -F$

55. The species, having bond angles of 120° is:
(a) PH_3 **(b)** ClF_3 **(c)** NCl_3 **(d)** BCl_3

56. The species Ar, K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase?
(a) $Ca^{2+} < K^+ < Ar$ **(b)** $K^+ < Ar < Ca^{2+}$
(c) $Ar < K^+ < Ca^{2+}$ **(d)** $Ca^{2+} < Ar < K^+$

57. The solubility of $BaSO_4$ in water is $2.42 \times 10^{-3} gL^{-1}$ at 298K. The value of solubility product (K_{sp}) will be [Given molar mass of $BaSO_4$ = 233 g mol^{-1}]
(a) 1.08×10^{-10} mol^2L^{-2} **(b)** 1.08×10^{-12} mol^2L^{-2}
(c) 1.08×10^{-14} mol^2L^{-2} **(d)** 1.08×10^{-8} mol^2L^{-2}

58. What is the activation energy for a reaction if its rate doubles when the temperature is raised from 20°C to 35°C?
(R = 8.314 J mol^{-1} K^{-1})
(a) 342 kJ mol^{-1} **(b)** 269 kJ mol^{-1}
(c) 34.7 kJ mol^{-1} **(d)** 15.1 kJ mol^{-1}

59. In which of the following options the order of arrangement does not agree with the variation of property indicated against it?
(a) I < Br < Cl < F (increasing electron gain enthalpy)
(b) Li < Na < K < Rb (increasing metallic radius)
(c) $Al^{3+} < Mg^{2+} < Na^+ < F^-$ (increasing ionic size)
(d) B < C < N < O (increasing first ionization enthalpy)

60. Aqueous solution of which of the following compounds is the best conductor of electric current?
(a) Hydrochloric acid, HCl **(b)** Ammonia, NH_3
(c) Fructose, $C_6H_{12}O_6$ **(d)** Acetic acid, $C_2H_4O_2$

61. The rate of first-order reaction is 0.04 mol L^{-1} s^{-1} at 10 seconds and 0.03 mol L^{-1} s^{-1} at 20 seconds after initiation of the reaction. The half-life period of the reaction is:
(a) 44.1 s **(b)** 54.1 s **(c)** 24.1 s **(d)** 34.1 s

62. In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two (—O—O—) bonds. Oxidation state of Cr in CrO_5 is:
(a) +5 **(b)** +3 **(c)** +6 **(d)** –10

63. The reaction of H_2O_2 with hydrogen sulphide is an example of …… reaction:
(a) addition **(b)** oxidation
(c) reduction **(d)** redox acidic

64. The enthalpy of vaporization of H_2O(l) is x kJ/mol and enthalpy of formation of water vapour y kJ/mol. Enthalpy of formation of H_2O(l). would be
(a) (y – x) kJ mol^{-1} **(b)** (x – y) kJ mol^{-1}
(c) (x + y) kJ mol^{-1} **(d)** (2x – y) kJ mol^{-1}

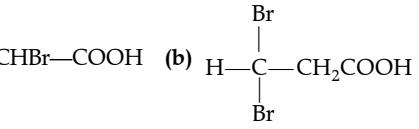
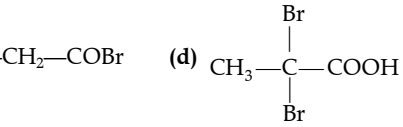
65. Equal volumes of four acid solutions having pH 1, 2, 3 and 4 are mixed in a container. The concentration of hydrogen ion in the mixture of.
(a) 4.25×10^{-4} M **(b)** 2.78×10^{-2} M
(c) 2.30×10^{-3} M **(d)** 1.35×10^{-2} M

66. A button cell used in watches functions as following:
Zn(*s*) + Ag_2O(*s*) + H_2O(*l*) → 2 Ag(*s*) + Zn^{2+}(*aq*) + $2OH^-$(*aq*)
If half-cell potentials are:
Zn^{2+}(*aq*) + $2e^-$ → Zn(*s*) E° = –0.76 V
Ag_2O(*s*) + H_2O(*l*) + $2e^-$ → 2Ag(*s*) + $2OH^-$(*aq*), E° = 0.34 V
The cell potential will be:
(a) 1.10 V **(b)** 0.42 V **(c)** 0.84 V **(d)** 1.34 V

67. The correct order of increasing bond length of C—H, C—O, C—C and C=C is:
(a) C—C < C=C < C—O < C—H
(b) C—O < C—H < C—C < C=C
(c) C—H < C—O < C—C < C=C
(d) C—H < C=C < C—O < C—C

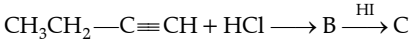
68. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?
(a) $Br_2 > I_2 > F_2 > Cl_2$ **(b)** $F_2 > Cl_2 > Br_2 > I_2$
(c) $I_2 > Br_2 > Cl_2 > F_2$ **(d)** $Cl_2 > Br_2 > F_2 > I_2$

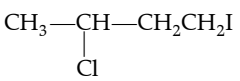
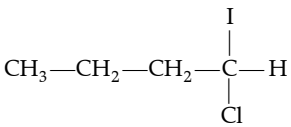
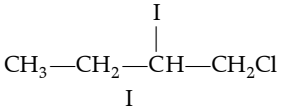
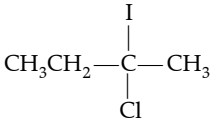
69. Gadolinium belongs to 4*f* series. It's atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?
(a) [Xe] $4f^8$ $6s^2$ **(b)** [Xe] $4f^9$ $5s^1$
(c) [Xe] $4f^7$ $5d^1$ $6s^2$ **(d)**[Xe] $4f^6$ $5d^2$ $6s^2$

70. Propionic acid with Br_2/P yields a dibromo product. Its structure would be:
(a) $CH_2Br—CHBr—COOH$ **(b)** 
(c) $CH_2Br—CH_2—COBr$ **(d)** 

71. At 25°C and 730 mm pressure, 380 ml of dry oxygen was collected. If the temperature is constant, what volume will the oxygen occupy at 760 mm pressure?
(a) 365 ml **(b)** 2 ml **(c)** 10 ml **(d)** 20 ml

72. Predict the product C obtained in the following reaction of 1-butyne.



(a) 
(b) 
(c) 
(d) 

73. Following compounds are given:

(i) CH_3CH_3OH **(ii)** CH_3COCH_3

(iii) $CH_3—\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CHOH}}$ **(iv)** CH_3OH

Which of the above compound**(s)**, on being warmed with iodine solution and NaOH, will give iodoform?

(a) (i), (iii) and (iv) **(b)** Only (ii)

(c) (i), (ii) and (iii) **(d) (i)** and (ii)

74. Consider the following statements.

(1) XeF_4 is colourless crystalline solid and undergoes sublimation.

(2) $XeOF_4$ is colourless volatile liquid.

(3) XeO_3 is colourless explosive solid.

The correct statements are:

(a) (1) and (2) only **(b)** (2) and (3) only

(c) (1) and (3) only **(d)** (1), (2) and (3)

75. A solution has 1 : 4 mole ratio of pentane to hexane. The vapour pressure of the pure hydrocarbons at 20°C are 440 mm of Hg for pentane and 120 mm of Hg for hexane. The mole fraction of pentane in the vapour phase would be:

(a) 0.549 **(b)** 0.200 **(c)** 0.786 **(d)** 0.478

76. One mole of Al^{3+} discharged completely by using charge?

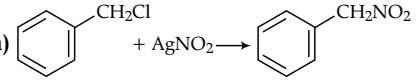
(a) 3F **(b)** 1F **(c)** 0.3F **(d)** 2F

77. In which of the following molecules/ions BF_3, NO_2^-, NH_2^- and H_2O, the central atom is sp^2 hybridised?

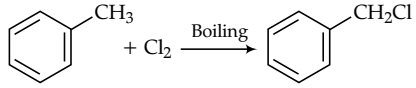
(a) NO_2^- and NH_2^- **(b)** NH_2^- and H_2O

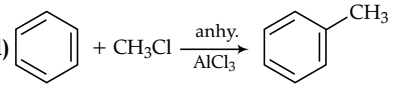
(c) NO_2^- and H_2O **(d)** BF_3 and NO_2^-

78. Which one of the following is a free-radical substitution reaction?

(a) 

(b) $CH_3CHO + HCN \longrightarrow CH_3—\underset{\displaystyle OH}{\overset{\displaystyle |}{CH}}—CN$

(c) 

(d) 

79. Consider the following reaction:

$$\text{Ethanol} \xrightarrow{PBr_3} X \xrightarrow{\text{alc. KOH}} Y \xrightarrow[\text{(ii) } H_2O,\ \text{heat}]{\text{(i) } H_2SO_4,\ \text{room temperature}} Z$$

The product Z is:

(a) $CH_3CH_2O—CH_2—CH_3$ **(b)** $CH_3—CH_2—O—SO_3H$

(c) CH_3CH_2OH **(d)** $CH_2=CH_2$

80. Which of the following is an ideal solution?

(a) Ethanol + water **(b)** Ethanol + benzene

(c) Nitric acid + water **(d)** Benzene + toluene

81. The efficiency of a fuel cell is given by:

(a) $\frac{\Delta G}{\Delta S}$ **(b)** $\frac{\Delta G}{\Delta H}$ **(c)** $\frac{\Delta S}{\Delta G}$ **(d)** $\frac{\Delta H}{\Delta G}$

82. Which of the following will not show cis-trans isomerism?

(a) $CH_3—CH=CH—CH_3$

(b) $CH_3—CH_2—CH=CH—CH_2CH_3$

(c) $CH_3—\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}=CH—CH_2—CH_3$

(d) $CH_3—\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}}—CH=CH—CH_2—CH_3$

83. Among the following compounds, one that is most reactive towards electrophilic nitration is

(a) benzoic acid. **(b)** nitrobenzene.

(c) toluene. **(d)** benzene.

84. At 25°C, the dissociation constant of a base, BOH is 1.0×10^{-12}. The concentration of hydroxyl ions in 0.01 M aqueous solution of the base would be:

(a) 2.0×10^{-6} mol L^{-1} **(b)** 1.0×10^{-5} mol L^{-1}

(c) 1.0×10^{-6} mol L^{-1} **(d)** 1.0×10^{-7} mol L^{-1}

85. If the enthalpy change for transition of liquid water to steam is 30 $kJmol^{-1}$ at 27°C. The entropy change for the process would be:

(a) 1.0 J mol^{-1} K^{-1} **(b)**0.1 J mol^{-1} K^{-1}

(c) 100 J mol^{-1} K^{-1} **(d)** 10 J mol^{-1} K^{-1}

Section B

86. In which electrophilic substitution reaction slow step is breaking of C—H bond?

(a) Sulphonation of benzene **(b)** Nitration of benzene

(c) Chlorination of benzene **(d)** All of these

87. Acetone and ethanol can be chemically distinguished by:

(a) I_2/NaOH **(b)** 2, 4 DNP

(c) Tollen's reagent **(d)** Both **(a)** and **(b)**

88. In which of the following reaction C–C bond formation does not take place?

(1) Gattermann–Koch reaction **(2)** Étard reaction

(3) Benzoin condensation **(4)** Swarts reaction

89. The value of ΔH and ΔS for the reaction,

$C_{(graphite)}(s) + CO_2(g) \rightarrow 2CO(g)$

are 170 kJ and 170 JK^{-1}, respectively. This reaction will be spontaneous at:

(a) 710 K **(b)** 910 K **(c)** 1110 K **(d)** 510 K

90. The experimental data for the reaction $2A + B_2 \longrightarrow 2AB$ is:

Exp.	[A]	[B]	Rate (Ms^{-1})
1.	0.50	0.50	1.6×10^{-4}
2.	0.50	1.00	3.2×10^{-4}
3.	1.00	1.00	3.2×10^{-4}

The rate equation for the above data is:

(a) rate = $k[B_2]$ **(b)** rate = $k[B_2]^2$

(c) rate = $k[A]^2[B]^2$ **(d)** rate = $k[A]^2[B]$

91. Given below are two statements

Statement I: SF_6 exists but SH_6 does not.

Statement II:

$d\pi - p\pi$ bonding cannot take place in SH_6.

Choose the correct answer from the options given below:

(a) Statement I is incorrect but Statement II is true.

(b) Both statement I and Statement II are true.

(c) Both Statement I and Statement II are false.

(d) Statement I is correct but statement II is false.

92. What is the correct IUPAC name of the following coordination compound.

$[Cr(py)_3Cl_3]$

(a) Trichlorotripyridinium chromium (III)

(b) Tripyridiniumtrichloro chromium (III)

(c) Trichlorotripyridine chromium (III)

(d) Trichlorotripyridine chromium (II)

93. The incorrect statements among the following is:

(a) Glucose on oxidation with Br_2/H_2O gives gluconic acid.

(b) The pentaacetate of glucose does not react with hydroxyl amine.

(c) The six membered cyclic structure of glucose is called furanose structure.

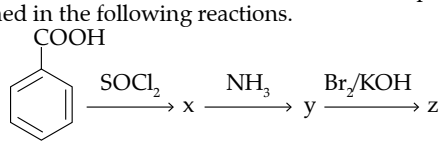
(d) The two cyclic hemiacetal forms of glucose are anomers of each other.

94. How many isomers are possible for coordination complex $[Co(NH_3)_5(NO_2)](NO_3)_2$.
(a) 6 **(b)** 10 **(c)** 4 **(d)** 12

95. The numbers of mole of phenylhydrazine needed to form fructosazone when react with fructose is:
(a) 1 **(b)** 2 **(c)** 3 **(d)** 4

96. Indicate the coordination number and oxidation state of the complex $[Ni(en)_2(C_2O_4)]NO_2$.
(a) +1 **(b)** +2 **(c)** –2 **(d)** +3

97. Give the IUPAC nomenclature of the final product(z) formed in the following reactions.



(a) Aniline **(b)** Chlorobenzene
(c) Benzamide **(d)** Benzoyl chloride

98. Match list I with List II.

List I		List II	
(A)	Protein	**(i)**	DNA
(B)	Nucleic acid	**(ii)**	Polymer of α-amino acids
(C)	Polysaccharides	**(iii)**	glucogen
(D)	Enzymes	**(iv)**	maltase

Choose the correct answer from the options given below.
(a) **(A)**-(ii), **(B)**-**(i)**, **(C)**-(iii), **(D)**-(iv)
(b) **(A)**-**(i)**, **(B)**-(ii), **(C)**-(iv), **(D)**-(iii)
(c) **(A)**-(iv), **(B)**-(iii), **(C)**-(ii), **(D)**-**(i)**
(d) **(A)**-(iii), **(B)**-(ii), **(C)**-(iv), **(D)**-**(i)**

99. Which of the following statement**(s)** is correct?
(a) $[Fe(CN)_6]^{4-}$ is diamagnetic but $[Fe(CN)_6]^{3-}$ is paramagnetic.
(b) Fe^{3+} ions always form tetrahedral complexes.
(c) In a compound with an octahedral structure, the d_{xy} and d_{yz} orbitals of a metal ion should be vacant.
(d) The ferric ammonium alum is a complex salt.

100. The fluoride of xenon with zero dipole moment is
(a) XeF_6 **(b)** XeO_3 **(c)** XeF_4 **(d)** XeF_2

BOTANY

Section A

101. Which is less general in characters as compared to genus?
(a) Family **(b)** Class **(c)** Division **(d)** Species

102. Which one is not a hot spot of India?
(a) Western Ghats **(b)** Aravalli Hills
(c) Indo-Burma **(d)** Himalaya

103. A cell organelle containing hydrolytic enzyme is:
(a) Mesosome **(b)** Lysosome
(c) Microsome **(d)** Ribosome

104. Ovary is half-inferior in the flowers of:
(a) Cucumber **(b)** Guava **(c)** Plum **(d)** Brinjal

105. In which one of the following processes, carbon dioxide is not released?
(a) Aerobic respiration in animals
(b) Alcoholic fermentation
(c) Lactate fermentation
(d) Aerobic respiration in plants

106. In *Bt* Cotton, the *Bt* toxin present in plant tissue as protoxin is converted into active toxin due to:
(a) Alkaline pH of the insect gut
(b) Acidic pH of the insect gut
(c) Action of gut microorganism
(d) Presence of conversion factors in insect gut

107. Which of the given part of oxysome is a peripheral membrane protein and contains the site for ATP synthesis?
(a) Headpiece **(b)** Base **(c)** Stalk **(d)** F_0 – part

108. The parasitic fungus on mustard plant is
(a) *Albugo* **(b)** *Ustilago*
(c) *Puccinia* **(d)** *Colletotrichum*

109. Chiasmata become clearly visible during ..... stage.
(a) diplotene **(b)** metaphase-I
(c) anaphase-I **(d)** pachytene

110. Place the following event of translation in the correct sequence:
(i) Binding of met-tRNA to the start codon.
(ii) Covalent bonding between two amino acids.
(iii) Binding of second tRNA.
(iv) Joining of small and large ribosome subunits.
(a) iii, iv, i, ii **(b)** i, iv, iii, ii **(c)** iv, iii, ii, i **(d)** ii, iii, iv, i

111. PGA as the first carbon dioxide fixation product was discovered in photosynthesis of
(a) Gymnosperm **(b)** Angiosperm
(c) Alga **(d)** Bryophyte

112. Swiss cheese is ripened with the help of bacterium:
(a) *Penicillium roqueforti* **(b)** *Penicillium camembertii*
(c) *Lactobacillus* **(d)** *Propionibacterium sharmanii*

113. The cutting of DNA at specific locations became possible with the discovery of:
(a) Restriction enzymes **(b)** Probes
(c) Selectable markers **(d)** Ligases

114. Read the following statements and select the incorrect one.
(a) Chloroplast has 70S ribosomes.
(b) Nucleolus is not bound by any membrane.
(c) RER helps in synthesis of fats and proteins.
(d) Lysosome contains hydrolytic enzymes.

115. Which of the given character of pea plants is seen only in pure lines?
(a) Round seeds **(b)** Yellow pods
(c) Full Pods **(d)** Violet flowers

116. A pair of plants which can prevent both autogamy as well as geitonogamy is:
(a) Cucurbits and coconut **(b)** Coconut and papaya
(c) Cucurbits and date palm **(d)** Date palm and papaya

117. Read the following statements.

Statement A: In primary structure of a protein, the left end is represented by the first amino acid and the right end by the last amino acid.

Statement B: In a polysaccharide chain, the right end is called the reducing end and the left end is called the non-reducing end.

Choose the correct option:
(a) Both the statements are correct
(b) Both the statements are incorrect
(c) Statement A is correct but statement B is incorrect
(d) Statement A is incorrect but statement B is correct

118. *Thermococcus*, *Methanococcus* and *Methanobacterium* exemplify:
(a) Bacteria that contain a cytoskeleton and ribosomes
(b) Archaebacteria that lack any histones resembling those found in eukaryotes but whose DNA is negatively supercoiled.
(c) Archaebacteria that contain protein homologous to eukaryotic core histones.
(d) Bacteria whose DNA is relaxed or positively supercoiled but which have a cytoskeleton as well as mitochondria.

119. The outermost layer of macromolecules in the prokaryotic cell envelope is …….
(a) cell wall **(b)** cell membrane
(c) glycocalyx **(d)** peptidoglycan

120. A typical angiosperm anther has 1200 pollen grains. How many pollen mother cells must have been there to produce them?
(a) 200 **(b)** 400 **(c)** 300 **(d)** 600

121. Match the following microbes with the Microbes Product:

A.	*Aspergillus niger*	i.	Lactic acid
B.	*Acetobacter aceti*	ii.	Butyric acid
C.	*Clostridium butylicum*	iii.	Acetic acid
D.	*Lactobacillus*	iv.	Citric acid

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

122. Which of the following is not true for an eukaryotic cell?
(a) Cell wall is made up of peptidoglycan.
(b) 80S type of ribosomes are present in the cytoplasm.
(c) Mitochondria contain circular DNA.
(d) Membrane bound organelles are present.

123. What is the genotypic ratio in test cross for a dihybrid cross if two genes are completely linked?
(a) 1 : 1 : 1 : 1 **(b)** 1 : 1 **(c)** 9 : 3 : 3 : 1 **(d)** 3 : 1

124. An organic non-protein substance bound to an enzyme and essential for its activity is:
(a) Coenzyme **(b)** Apoenzyme
(c) Holoenzyme **(d)** Isoenzyme

125. Plants which produce characteristic pneumatophores and show vivipary belong to:
(a) Mesophytes **(b)** Halophytes
(c) Psammophytes **(d)** Hydrophytes

126. In the DNA of an organism a total number of 5386 nucleotides were present. The proportion of different bases were: Adenine = 29%; Guanine = 17%; Cytosine = 32%, Thymine = 17%. Considering the Chargaff's rule it can be concluded that:
(a) It is a single stranded linear RNA.
(b) It is single stranded linear DNA.
(c) It is a double stranded linear DNA.
(d) It is a double stranded circular DNA.

127. In genetic engineering, the antibiotics are used:
(a) As selectable markers.
(b) To select healthy vectors.
(c) As sequences from where replication starts.
(d) To keep the culture free of infection.

128. Which one of the following organisms is not a eukaryote?
(a) *Parameciun caudatum* **(b)** *Escherichia coli*
(c) *Euglena viridis* **(d)** *Amoeba proteus*

129. The end products of fermentation is
(1) CO_2 **(2)** Ethanol
(3) Oxygen **(4)** Acetaldehyde
(a) (1) only **(b)** (1) and (2) only
(c) (2) and (3) only **(d)** (3) and (4) only

130. The osmotic expansion of a cells kept in water is chiefly regulated by:
(a) Mitochondria **(b)** Vacuoles
(c) Plastids **(d)** Ribosomes

131. Feedstock for biodiesel can primarily be obtained from
(a) *Nymphaea* **(b)** *Abelmoschus*
(c) *Triticum* **(d)** *Jatropha*

132. Pteridophytes and Bryophytes differ in having:
(a) Spermatozoids **(b)** Conducting system
(c) Separate gametophytes **(d)** Archegonia

133. There are three major types of RNAs present in bacteria and each of them has specific functions.
(i) *m*RNA – Provides the template for translation.
(ii) *t*RNA – Brings polypeptide chain and reads the transcription unit.
(iii) *r*RNA – Plays structural and catalytic role during translation.
Identify the type**(s)** of RNA with its incorrect matching of function
(a) (i) and (ii) **(b)** only (i)
(c) (ii) and (iii) **(d)** only (ii)

134. Which of the following pairs is incorrectly matched?

(i)	Gregor Johann Mendel	Father of genetics
(ii)	Reginald	Punnett square
(iii)	Walter Sutton and de Vries	Chromosomal theory of inheritance
(iv)	Von Tschermak	Linkage in *Drosophila*

(a) (i) and (ii) **(b)** Both **(i)** and (iii)
(c) Only (ii) **(d)** Both (iii) and (iv)

135. Which one of the following statements is correct about Bryophytes?
(a) Sporophyte and gametophyte generations are independent.
(b) Sporophyte is partially dependent upon gametophyte.
(c) Gametophyte is dependent upon Sporophyte.
(d) Inconspicuous gametophyte is present.

Section B

136. Specialised epidermal cells surrounding the guard cells are called:
(a) Lenticels **(b)** Complimentary cells
(c) Subsidiary cells **(d)** Bulliform cells

137. Which type of diversity is shown by Rauwolfia vomitoria in terms of the potency and concentration of reserpine that it produces?
(a) genetic diversity **(b)** species diversity
(c) ecological diversity **(d)** biodiversity

138. Which of the following component of phloem is made up of sclerenchymatous cells?
(a) Companion cells **(b)** Bast fiber
(c) Sieve tubes **(d)** Xylem fiber

139. Which is the basic requirement for any type of ecosystem to function and sustain?
(a) Constant output of solar energy
(b) Constant input of solar energy
(c) Organic substances
(d) Organic substances dissolved in water

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(c) Organic substances
(d) Organic substances dissolved in water

141. Saccharomyces cerevisiae is used to produce enzyme …….
(a) invertase **(b)** pectinase **(c)** lipase **(d)** cellulase

142. Select the wrong statement.
(a) Maximum species diversity is associated with tropical rain forest.
(b) Only biotic factors affect the magnitude of primary productivity.
(c) Energy flow in an ecosystem is always unidirectional.
(d) GFC is major conduit of energy flow in aquatic Ecosystem.

143. Vascular bundles in monocotyledons are considered closed because:
(a) Xylem is surrounded all around by phloem.
(b) A bundle sheath surrounds each bundle
(c) Cambium is absent.
(d) There are no vessels with perforations.

144. Identify free living bacterial biofertlizer …….
(a) *Rhizobium* **(b)** *Azotobacter*
(c) *Nostoc* **(d)** *Bacillus thuringiensis*

145. A template strand of DNA has base sequence CATGATTAC. New strand synthesized on it will be :
(a) GATCAUATG **(b)** GTACTAACG
(c) GAACTAATG **(d)** GTACTAATG

146. Select the incorrect statement with respect to gymnosperms.
(a) Gymnosperms are heterosporous.
(b) The giant red wood tree *Sequoia* belongs to gymnosperms.
(c) The pattern of arrangement of reproductive structures of gymnosperms is spores → sporangia → strobili → sporophylls.
(d) *Ginkgo* and *Pinus* belongs to gymnosperms.

147. Read the statements given below and fill the blanks with correct option for 'X' and 'Y'.
(I) During the course of evolution, vascular plants first originated in ____'X'____period.
(II) Herbaceous lycopods and arborescent lycopods evolved from *Zosterophyllum* of ____'Y'____ era.
(a) 'X' - Devonian, 'Y' - Palaeozoic
(b) 'X' - Silurian, 'Y' - Palaeozoic
(c) 'X' - Permian, 'Y' - Mesozoic
(d) 'X' - Cretaceous, 'Y' - Cenozoic

148. How many of the codons listed in the box codes for valine?

UUA, CUC, AUU, GUA, UCC, CCU, ACA, GUU

(a) 2 **(b)** 3 **(c)** 4 **(d)** 5

149. When a cross is made between tall plant with round seeds (TtRr) and tall plant with wrinkled seeds (Ttrr), the proportions of phenotype (A) tall and wrinkled (B) dwarf and wrinkled in the offspring could be expected to be:
(a) (A) 37.5% **(B)** 12.5% **(b) (A)** 12.5% **(B)** 12.5%
(c) (A) 25% **(B)** 50% **(d) (A)** 50% **(B)** 25%

150. *Escherichia coli* bacteria is grown in a medium that contained ^{15}N and after sometime the cells were transferred into a medium containing ^{14}N. A CsCl density gradient centrifugation of the DNA is done after two rounds of replication. How many bands will be observed in the second round?
(a) One **(b)** Two **(c)** Three **(d)** Four

ZOOLOGY

Section A

151. Which one of the following organisms is scientifically correctly named, correctly printed according to the International Rules of Zoological Nomenclature and correctly described?
(a) *Musca domestica* – The common house lizard, a reptile
(b) *Plasmodium falciparum* – A protozoan pathogen causing the most serious type of malaria.
(c) *Felis tigris* – The Indian tiger, well protected in Gir forests
(d) *E. coli* – Full name *Entamoeba coli* a commonly occurring bacterium in human intestine.

152. After childbirth a woman is not able to release milk to feed her child. Which hormone could help in milk ejection?
(a) Prolactin **(b)** Pitocin
(c) Estrogen **(d)** Progesterone

153. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of:
(a) *m*RNA **(b)** *r*RNA **(c)** *t*RNA **(d)** *hn*RNA

154. Find the odd one out.
(a) Sea cucumber **(b)** Sea urchin
(c) Sea anemone **(d)** Sea lily

155. Neoplastic transformation may occur as a result of:
(a) Non-ionizing radiation like X-rays.
(b) Ionizing radiation like UV-rays.
(c) Non-ionizing gamma rays.
(d) Both ionizing and non-ionizing radiations.

156. Which one is not a feature of *Adamsia*?
(a) Metagenesis **(b)** Gastrovascular cavity
(c) Diploblastic **(d)** Cnidoblast

157. Uricotelic mode of excreting nitrogenous wastes is found in:
(a) Reptiles and birds **(b)** Birds and annelids
(c) Amphibians and reptiles **(d)** Insects and amphibians

158. Whose experiments cracked DNA and discovered triplet nature of genetic code?
(a) Nirenberg and Mathaei **(b)** Beadle and Tatum
(c) Hershey and Chase **(d)** Morgan and Sturtevant

159. Which of the following is a non-medicated IUD?
(a) Lippe's loop **(b)** Multiload - 375
(c) LNG - 20 **(d)** Progestasert

160. How do parasympathetic neural signals affect the working of the heart?
(a) Reduce both heart rate and cardiac output.
(b) Heart rate is increased without affecting the cardiac output.
(c) Both heart rate and cardiac output increase.
(d) Heart rate decreases but cardiac output.

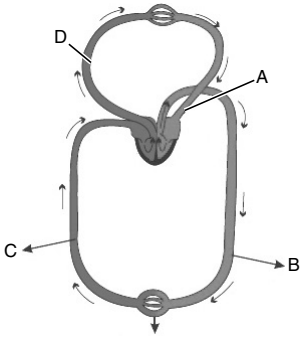
161. Choose the incorrect statement with respect to blood.
(a) Blood is a fluid connective tissue.
(b) It consists of formed elements and plasma.
(c) Blood cells and plasma both are responsible for transportation of O_2 and CO_2.
(d) Cells of blood form matrix and structural proteins like other connective tissues.

162. The most abundant protein in animals is _____ and most abundant protein on Earth is _____respectively. Choose the option that fills the blanks correctly.
(a) RuBisCo and Elastin **(b)** Collagen and Elastin
(c) RuBisCo and Collagen **(d)** Collagen and RuBisCO

163. C-peptide of human insulin is
(a) a part of mature insulin molecule.
(b) responsible for its biological activity.
(c) responsible for formation of disulphide bridges.
(d) removed during maturation of pro-insulin to insulin.

164. Select the Taxon mentioned which represent both marine and fresh water species.
(a) Echinoderms **(b)** Ctenophora
(c) Cephalochordata **(d)** Cnidaria

165. The figure shows the schematic plan of blood circulation in humans with labels A, B, C and D. Choose the correct option labelled with its functions.



(a) A – pulmonary vein – takes impure blood from body parts, pO_2 = 60 mm Hg
(b) B – pulmonary artery – takes blood from heart to lungs, pO_2 = 90 mm Hg
(c) C – vena cava – takes blood from body parts to right auricle, pCO_2 = 45 mm Hg
(d) D – dorsal aorta – takes blood from heart to body parts, pO_2 = 95 mm Hg

166. Select the correct match with respect to infection and its causative agent:
(a) Gonorrhoea – *Trichomonas* **(b)** Genital warts – *Treponema*
(c) Syphilis – *Neisseria* **(d)** Tetanus – *Clostridium*

167. What is correct to say about the hormone action in humans?
(a) Glucagon is secreted by β-cells of islets of Langerhans and stimulates glycogenolysis.
(b) Secretion of thymosin is stimulated with ageing.
(c) In females, FSH first binds with specific receptors on ovarian cell membrane.
(d) FSH stimulates the secretion of oestrogen and progesterone.

168. Select the correct statement.
(a) Morphine is extracted from the leaves of Cannabis sativa.
(b) Chikungunya and amoebic dysentery are both transmitted through mosquito as a vector.
(c) Anti-histamine, adrenaline and steroids quickly reduce the symptoms of allergy.
(d) T-lymphocytes act like an HIV factory.

169. A plover bird and crocodiles have a particular interaction, that is:
(a) Commensalism **(b)** Protocooperation
(c) Mutualism **(d)** Competition

170. In counter current mechanism, the concentration gradient in the medullary interstitium is mainly maintained by
(a) HCO_3^- and K^+ **(b)** NaCl and H_2O
(c) NaCl and urea **(d)** K^+ and H^+

171. Which of the following is not observed during contraction of a muscle fibre?
(a) A bands retain the length.
(b) Shortening of sarcomere.
(c) I band gets reduced.
(d) H zone retains the length.

172. Read the following statements and choose the correct option.
Statement A: The most primitive of all craniates are jawless vertebrates.
Statement B: Cyclostomes have paired appendages and sucking circular mouth.
(a) Both statements are correct.
(b) Both statements are incorrect.
(c) Statement A is correct but statement B is incorrect.
(d) Statement A is incorrect but statement B is correct.

173. In mammalian eye, the 'fovea' is the centre of the visual field where:
(a) High density of cones occur, but has no rods.
(b) The optic nerve leaves the eye.
(c) Only rods are present.
(d) More rods than cones are found.

174. All are functions of Sertoli cells except:
(a) Formation of blood testis barrier.
(b) Secretion of smegma.
(c) Secretes Anti Mullerian Factor.
(d) Secretes Androgen Binding Protein.

175. Hypothalmic hormones are transported to neurohypophysis through:
(a) Portal vein **(b)** Portal artery
(c) Axons **(d)** Lymph vessel

176. What is the minimum number of plasma membrane that oxygen has to diffuse across to pass from air in the alveolus to haemoglobin inside a R.B.C.?
(a) Two **(b)** Three **(c)** Four **(d)** Five

177. Choose the correct statement regarding mode of transmission of HIV?
(a) Drug addicts have least chance to be infected with AIDS.
(b) Individuals who need repeated blood transfusion, HIV can be transmitted by sharing needles.
(c) Contaminated through saliva.
(d) Biting through contaminated mosquito.

178. The genetic disease that transfers from a phenotypically normal but carrier female to only some of the male progenies. The disease is:
(a) Autosomal dominant **(b)** Autosomal recessive
(c) Sex-linked dominant **(d)** Sex-linked recessive

179. Incorrect question formation:
Which of the following is correct in regards to the diluted urine in the excretory system of human beings?
(a) Nearly 99% of the glomerular filtrate is reabsorbed by the renal tubules.
(b) Ascending limb of the loop of Henle is impermeable to electrolytes.
(c) Descending limb of loop of Henle is impermeable to water.
(d) Distal convoluted tubule is incapable of reabsorbing HCO_3^-.

180. Which of the following is correct regarding thrombin?
(a) It is a protein of primary structure.
(b) Converts soluble fibrinogen of plasma into insoluble fibrin.
(c) Converts insoluble fibrinogen into insoluble fibrin.
(d) Converts fibrin into fibrinogen.

181. If one kidney is removed what will be the immediate effect?
(a) The person will die due to lack of urine formation.
(b) Uremia and death.
(c) Death due to poisoning.
(d) The person may survive.

182. Cardiac notch is present in:
(a) Superior lobe of right lung
(b) Inferior lobe of left lung
(c) Superior lobe of left lung
(d) Inferior lobe of right lung

183. The cartilage generally present on long bone terminals is:
(a) Hyaline cartilage
(b) Fibrous cartilage
(c) Hyaline and calcified cartilage
(d) Elastic cartilage

184. Poikilothermic animals having monocondylic skull and amnion belong to the class:
(a) Amphibia **(b)** Reptilia **(c)** Aves **(d)** Mammalia

185. Name the cytokines which is released in response to virus infection.
(a) Monokines **(b)** Lymphokines
(c) Interleukins **(d)** Interferons

Section B

186. When does the Oxygen dissociation curve shift to the right?
(a) Decrease in acidity
(b) Increase in carbon dioxide concentration
(c) Decrease in temperature
(d) Decrease in pH

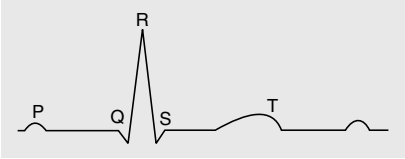
187. How many sperms are formed from a secondary spermatocyte?
(a) 4 **(b)** 8 **(c)** 2 **(d)** 1

188. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:
(a) p^2 **(b)** $2pq$ **(c)** pq **(d)** q^2

189. Which one of the following hormones maintains the Pregnancy in second trimester?
(a) LH (luteinizing hormone)
(b) progesterone
(c) estrogen
(d) hCG (human Chorionic Gonadotropin)

190. Volume of air that will remain in the lungs after a normal expiration is:
(a) FRC **(b)** VC **(c)** ERV **(d)** IRV

191. The diagram given here is the standard ECG of a normal person. The P-wave represents the:



(a) Contraction of both atria
(b) Initiation of the ventricular contraction
(c) Beginning of the systole
(d) End of the systole

192. Following are the two statements regarding the origin of life:
(i) The earliest organisms that appeared on the earth were non-green and presumably anaerobes.
(ii) The first autotrophic organisms were the chemoautotrophs that never released oxygen.
(a) (ii) is correct but **(i)** is false
(b) Both **(i)** and (ii) are correct
(c) Both **(i)** and (ii) are false
(d) **(i)** is correct but (ii) is false

193. MALT is considered as the secondary lymphoid organ which is located within the lining of major tracts in the body. Here, MALT stands for:
(a) Metaderm Associated Lymphoid Tissues
(b) Medulla Associated Lymphoid Tissues
(c) Mucosal Associated Lymphoid Tissues
(d) Mucosal Associated Leukemia Tissues

194. Identify the wrong statement regarding evolution.
(a) Darwin's variations are small and directional.
(b) Mutations are random and non-directional.
(c) Adaptive radiations leads to divergent evolution.
(d) Mutations are non-random and directional.

195.

Blood groups	Receive Blood from	Donate Blood to
A	A, O	'P'
B	B, O	'Q'
AB	'R'	AB
O	'S'	O, A, B, AB

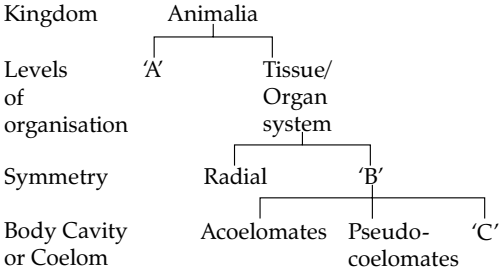
Choose the correct option for 'P', 'Q', 'R' and 'S'
(a) 'P'-A, AB; 'Q'-B, AB; 'R'-AB, A, B, O; 'S'-O
(b) 'P'-A; 'Q'-O, A, B, AB; 'R'-AB, A, B, O; 'S'-A, B
(c) 'P'-O; 'Q'-B, AB; 'R'-A; 'S'-AB, A, B, O
(d) 'P'-O; 'Q'-O, A, B, AB; 'R'-B; 'S'-AB

196. Which one of the following synovial joint is incorrectly matched with its position?
(a) Hinge Joint → Knee
(b) Pivot Joint → Between Atlas and Axis
(c) Gliding Joint→Between Carpal bones
(d) Ellipsoid Joint →Between pectoral girdle and head of humerus

197. Read the statements given below:
(i) It is a sex-linked recessive disease.
(ii) It is caused by the substitution of Glutamic acid (Glu) by Valine (Val) at eighth position of the beta globin chain of the haemoglobin molecule.
(iii) In this, RBCs shape change from biconcave disc to the elongated sickle-cell structure.
(iv) This defect is beneficial to people living in malarial prone areas.
How many of the above are true for sickle-cell anaemia?
(a) 3 **(b)** 2 **(c)** 4 **(d)** 1

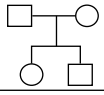
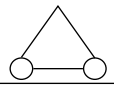
198. In Human Genome Project, sequence of which chromosome was completed in May, 2006:
(a) Chromosome X **(b)** Chromosome Y
(c) Chromosome 1 **(d)** Chromosome II

199. Complete the following chart by choosing correct option for 'A', 'B' and 'C'.



	A	B	C
(a)	Cellular	Bilateral	Coelomates
(b)	Cellular	Asymmetry	Eucoelomates
(c)	Cellular	Asymmetry	Enterocoelomate
(d)	Schizo cellular	Biradial	Coelomates

200. Match the following symbols of the pedigree analysis, with their correct representation:

(A) 	**(i)** Monozygotic Twins
(B) 	(ii) Heterozygous Male
(C) 	(iii) Sex unspecified
(D) 	(iv) Parents above and children below

Select the correct option from the following:

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