NEET (UG)

Sample Question Paper-1

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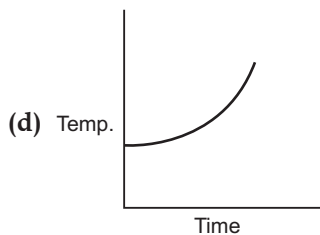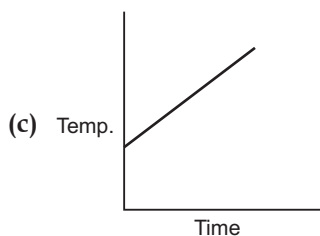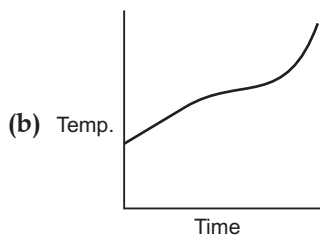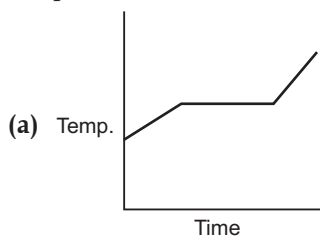
Important Instructions:

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

Q. 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

Q. 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

Q. 3. A common emitter amplifier has a voltage gain of 50, an input impedance of 100 Ω and an output impedance of 200 Ω. The power gain of the amplifier is:

(a) 1000   (b) 1250
(c) 100   (d) 500

Q. 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

Q. 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

Q. 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°

Q. 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) $\dfrac{2}{3}$ m   (d) 219 m

Q. 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) $2\pi\sqrt{\dfrac{(x_1^2 + x_2^2)}{(v_1^2 + v_2^2)}}$ (b) $2\pi\sqrt{\dfrac{(x_2^2 - x_1^2)}{(v_1^2 + v_2^2)}}$

(c) $2\pi\sqrt{\dfrac{(x_2^2 - x_1^2)}{(v_1^2 - v_2^2)}}$ (d) $2\pi\sqrt{\dfrac{(v_1^2 - v_2^2)}{(x_1^2 - x_2^2)}}$

Q. 9. A polarizer is used to

(a) reduce intensity of light.
(b) produce polarized light.
(c) increase intensity of light.
(d) produce unpolarized light.

Q. 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

Q. 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

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

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

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

Q. 13. The oscillation of a body on a smooth horizontal surface is represented by the equation $X = A\cos(\omega t)$, 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'?

Q. 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) $\dfrac{I_0}{2}$

(c) $\dfrac{I_0}{4}$ (d) Zero

Q. 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

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

(a) Density   (b) Volume
(c) Pressure   (d) Specific heat

Q. 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, $a = 1, b = 1, c = -2$

Q. 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?

(a) Temp.

Time

(b) Temp.

Time

(c) Temp.

Time

(d) Temp.

Time

Q. 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

Q. 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

Q. 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)** $\propto 1/r^3$

Q. 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

Q. 23. From the graph between current i and voltage V shown below, identify the portion corresponding to negative resistance:
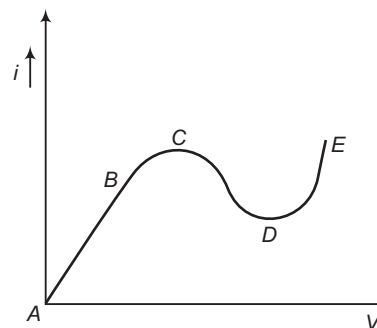
(a) DE   **(b)** CD
(c) BC   **(d)** AB

Q. 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

Q. 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)** $m[v_2 - v_1]$

Q. 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) $\lambda/4$ (b) $\lambda/6$

(c) 6λ (d) 4λ

Q. 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) $\lambda/2$

(c) 2λ (d) 4λ

Q. 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

Q. 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

Q. 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

Q. 31. Two heat engines A and B have their sources at 1000 K and 1100 K and their sinks are at 500 K and 400 K respectively. What is true about their efficiencies?

(a) $\eta_A = \eta_B$ (b) $\eta_A > \eta_B$

(c) $\eta_A < \eta_B$ (d) cannot predict

Q. 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

Q. 33. Through which character we can distinguish the light waves from sound waves:

(a) Interference   (b) Refraction

(c) Polarization   (d) Reflection

Q. 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

Q. 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

Q. 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) $5:3$

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

(a) $5 \sin (\omega t + 53°)$ (b) $5 \sin (\omega t + 37°)$

(c) $5 \sin (\omega t + 45°)$ (d) $5 \cos (\omega t + 53°)$

Q. 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

Q. 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) $\sqrt{4gh/3}$

Q. 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

Q. 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

Q. 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) $\sqrt{3} : \sqrt{2}$

Q. 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

Q. 44. An electron revolving around the nucleus with an angular momentum (L) has a magnetic moment

(a) $\dfrac{e}{m}L$ (b) $\dfrac{e}{2m}L$

(c) $\dfrac{2e}{m}L$ (d) $\dfrac{e}{2\pi m}L$

Q. 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

Q. 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

Q. 47. Voltage and current in AC circuit are given by $V = 10 \sin\left(50\pi t - \dfrac{\pi}{6}\right)$ and $I = 4 \sin\left(50\pi t + \dfrac{\pi}{6}\right)$

(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°

Q. 48. The acceleration of electron in the first orbit of hydrogen atom is

(a) $\dfrac{4\pi^2 m}{h^3}$ (b) $\dfrac{h^2}{4\pi^2 mr}$

(c) $\dfrac{h^2}{4\pi^2 m^2 r^3}$ (d) $\dfrac{m^2 h^2}{4\pi^2 r^3}$

Q. 49. A radioactive substance disintegrates to 1/64 of its initial value after 120 s. The half life of this substance

(a) 5 s   (b) 10 s

(c) 20 s   (d) 30 s

Q. 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 >

Q. 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

Q. 52. Which of the following statements about hydrogen is incorrect?

(a) Hydronium ion, H_3O^+ exists freely in solution.

(b) Dihydrogen does not act as a reducing agent.

(c) Hydrogen has three isotopes of which tritium is the least common.

(d) Hydrogen never acts as cation in ionic salts.

Q. 53. The angular momentum of electron in 'd' orbital is equal to:

(a) $2\sqrt{3}h$ (b) h

(c) $\sqrt{6}h$ (d) $\sqrt{2}h$

Q. 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) $-NR_2 > -OR > -F$

Q. 55. The species, having bond angles of 120° is:

(a) PH_3 (b) ClF_3

(c) NCl_3 (d) BCl_3

Q. 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) $Ca^{2+} < Ar < K^+$

Q. 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}

Q. 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}

Q. 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)

Q. 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, $C_2H_4O_2$

Q. 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

Q. 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

Q. 63. The reaction of H_2O_2 with hydrogen sulphide is an example of .... reaction:

(a) addition   (b) oxidation

(c) reduction   (d) redox acidic

Q. 64. Which property of colloidal solution is independent of charge on the colloidal particles?

(a) Coagulation   (b) Electrophoresis
(c) Electro-osmosis (d) Tyndall Effect

Q. 65. In context with beryllium, which one of the following statements is incorrect?

(a) It is rendered passive by nitric acid.
(b) It forms Be_2C.
(c) Its salts rarely hydrolyze.
(d) Its hydride is electron-deficient and polymeric.

Q. 66. A button cell used in watches functions as following:

$$Zn(s) + Ag_2O(s) + H_2O(l) \rightarrow 2\,Ag(s) + Zn^{2+}(aq)$$
$$+ 2OH^-(aq)$$

If half-cell potentials are:

$$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s) \qquad E° = -0.76\ V$$

$$Ag_2O(s) + H_2O(l) + 2e^- \rightarrow 2Ag(s) + 2OH^-(aq),$$
$$E° = 0.34\ V$$

The cell potential will be:

(a) 1.10 V   (b) 0.42 V
(c) 0.84 V   (d) 1.34 V

Q. 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

Q. 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) $Cl_2 > Br_2 > F_2 > I_2$

Q. 69. Gadolinium belongs to $4f$ 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) $[Xe]\ 4f^6\ 5d^2\ 6s^2$

Q. 70. Propionic acid with Br_2/P yields a dibromo product. Its structure would be:

(a) CH_2Br—$CHBr$—$COOH$

(b)
$$\begin{array}{c} Br \\ | \\ H-C-CH_2COOH \\ | \\ Br \end{array}$$

(c) CH_2Br—CH_2—$COBr$

(d)
$$\begin{array}{c} Br \\ | \\ CH_3-C-COOH \\ | \\ Br \end{array}$$

Q. 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

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

$$CH_3CH_2-C\equiv CH + HCl \longrightarrow B \xrightarrow{\ HI\ } C$$

(a)
$$\begin{array}{c} CH_3-CH-CH_2CH_2I \\ | \\ Cl \end{array}$$

(b)
$$\begin{array}{c} I \\ | \\ CH_3-CH_2-CH_2-C-H \\ | \\ Cl \end{array}$$

(c)
$$\begin{array}{c} I \\ | \\ CH_3-CH_2-CH-CH_2Cl \end{array}$$

(d)
$$\begin{array}{c} I \\ | \\ CH_3CH_2-C-CH_3 \\ | \\ Cl \end{array}$$

Q. 73. Following compounds are given:

(i) CH_3CH_3OH (ii) CH_3COCH_3
(iii)
$$\begin{array}{c} CH_3-CHOH \\ | \\ CH_3 \end{array}$$
(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)

Q. 74. The appearance of colour in solid alkali metal halides is generally due to:

(a) Interstitial positions
(b) F-centres
(c) Schottky defect
(d) Frenkel defect

Q. 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

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

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

Q. 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^-

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

(a) + $AgNO_2$ →

(b) $CH_3CHO + HCN \longrightarrow CH_3—CH—CN$
                                 OH

(c) + Cl_2 $\xrightarrow{\text{Boiling}}$

(d) + CH_3Cl $\xrightarrow[\text{AlCl}_3]{\text{anhy.}}$
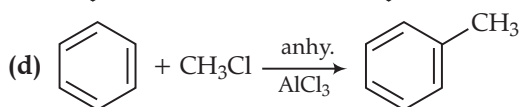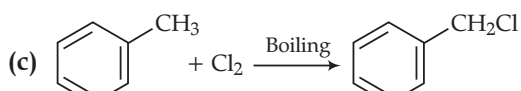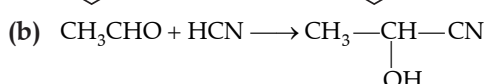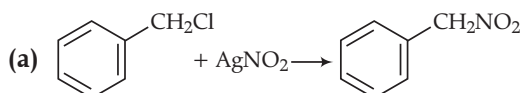
Q. 79. Consider the following reaction:

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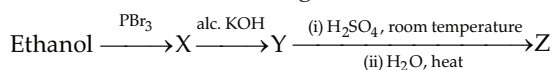
The product Z is:

(a) $CH_3CH_2O—CH_2—CH_3$
(b) $CH_3—CH_2—O—SO_3H$
(c) CH_3CH_2OH
(d) $CH_2=CH_2$

Q. 80. Which of the following is an ideal solution?

(a) Ethanol + water
(b) Ethanol + benzene
(c) Nitric acid + water
(d) Benzene + toluene

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

(a) $\dfrac{\Delta G}{\Delta S}$ (b) $\dfrac{\Delta G}{\Delta H}$

(c) $\dfrac{\Delta S}{\Delta G}$ (d) $\dfrac{\Delta H}{\Delta G}$

Q. 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) $CH_3—\underset{\underset{CH_3}{|}}{C}=CH—CH_2—CH_3$

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

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

(a) benzoic acid.   (b) nitrobenzene.
(c) toluene.   (d) benzene.

Q. 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}

Q. 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

Q. 86. Match items of Column I with the items of Column II and assign the correct code:

Column I	Column II
(A) Cyanide process	(i) Ultrapure Ge
(B) Froth floatation process	(ii) Dressing of ZnS
(C) Electrolytic reduction	(iii) Extraction of Al
(D) Zone refining	(iv) Extraction of Au
	(v) Purification of Ni

Code:

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

Q. 87. Chloramphenicol is an

    (a) antifertility drug.

    (b) antihistaminic.

    (c) antiseptic and disinfectant.

    (d) antibiotic-broad spectrum.

Q. 88. Nylon is an example of

    (a) polyamide.   **(b)** polythene.

    (c) polyester.   **(d)** polysaccharide.

Q. 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

Q. 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 $= k[A]^2[B]$

Q. 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.

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

$$[Cr(py)_3Cl_3]$$
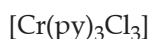
    (a) Trichlorotripyridinium chromium (III)

    (b) Tripyridiniumtrichloro chromium (III)

    (c) Trichlorotripyridine chromium (III)

    (d) Trichlorotripyridine chromium (II)

Q. 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.

Q. 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

Q. 95. Match List I with List II.

	List I		List II
(A)	Depletion of ozone layer	(i)	CO_2
(B)	Acid rain	(ii)	NO
(C)	Photochemical smog	(iii)	SO_2
(D)	Green house effect	(iv)	CFC

Choose the correct answer from the options given below:

    (a) (A)-(iii), (B)-(iv), (C)-(i), (D)-(ii)

    (b) (A)-(ii), (B)-(i), (C)-(iv), (D)-(iii)

    (c) (A)-(iv), (B)-(iii), (C)-(ii), (D)-(i)

    (d) (A)-(ii), (B)-(iv), (C)-(i), (D)-(iii)

Q. 96. Indicate the coordination number and oxidation state of the complex $[Ni(en)_2 (C_2O_4)]NO_2$.

    (a) 6 and 2

    (b) 2 and 2

    (c) 4 and 3

    (d) 6 and 3

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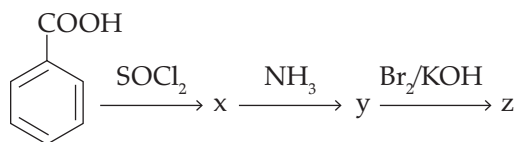
    (a) Aniline

    (b) Chlorobenzene

    (c) Benzamide

    (d) Benzoyl chloride

Q. 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)

Q. 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.

Q. 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

Q. 101. Which is less general in characters as compared to genus?

(a) Family   (b) Class
(c) Division   (d) Species

Q. 102. Which one is not a hot spot of India?

(a) Western Ghats (b) Aravalli Hills
(c) Indo-Burma   (d) Himalaya

Q. 103. A cell organelle containing hydrolytic enzyme is:

(a) Mesosome   (b) Lysosome
(c) Microsome   (d) Ribosome

Q. 104. Ovary is half-inferior in the flowers of:

(a) Cucumber   (b) Guava
(c) Plum   (d) Brinjal

Q. 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

Q. 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

Q. 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

Q. 108. The parasitic fungus on mustard plant is

(a) *Albugo*   (b) *Ustilago*
(c) *Puccinia*   (d) *Colletotrichum*

Q. 109. Maturation promoting factor (MPF) is formed by

(a) G_1 Cyclin + cdc 2 Kinase
(b) G_2 Cyclin + cdc 1 Kinase
(c) Mitotic Cyclin + cdc 2 Kinase
(d) Mitotic cyclin

Q. 110. Deletion of which domain of ARS would give the least replication rate in eukaryotes:

(a) B1 domain   (b) A domain
(c) B2 domain   (d) B3 domain

Q. 111. PGA as the first carbon dioxide fixation product was discovered in photosynthesis of

(a) Gymnosperm (b) Angiosperm
(c) Alga   (d) Bryophyte

Q. 112. Swiss cheese is ripened with the help of bacterium:

(a) *Penicillium roqueforti*
(b) *Penicillium cambertii*
(c) *Lactobacillus*
(d) *Propionibacterium sharmanii*

Q. 113. The cutting of DNA at specific locations became possible with the discovery of:

(a) Restriction enzymes
(b) Probes
(c) Selectable markers
(d) Ligases

Q. 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.

Q. 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

Q. 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

Q. 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

Q. 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.

Q. 119. Which of these is exposed on the outer surface of a gram-negative bacterium?

(a) Braun lipoprotein
(b) O-antigen of lipopolysaccharide (LPS)
(c) Polysaccharide portion of lipoteichoic acid (LTA)
(d) Electron transport system components

Q. 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

Q. 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

Q. 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.

Q. 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) $3:1$

Q. 124. An organic non-protein substance bound to an enzyme and essential for its activity is:

(a) Coenzyme   (b) Apoenzyme
(c) Holoenzyme   (d) Isoenzyme

Q. 125. Plants which produce characteristic pneumatophores and show vivipary belong to:

(a) Mesophytes
(b) Halophytes

(c) Psammophytes

(d) Hydrophytes

Q. 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.

Q. 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.

Q. 128. Which one of the following organisms is not a eukaryote?

(a) *Paramecium caudatum*

(b) *Escherichia coli*

(c) *Euglena viridis*

(d) *Amoeba proteus*

Q. 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

Q. 130. The osmotic expansion of a cells kept in water is chiefly regulated by:

(a) Mitochondria (b) Vacuoles

(c) Plastids   (d) Ribosomes

Q. 131. Feedstock for biodiesel can primarily be obtained from

(a) *Nymphaea*   (b) *Abelmoschus*

(c) *Triticum*   (d) *Jatropha*

Q. 132. Pteridophytes and Bryophytes differ in having:

(a) Spermatozoids

(b) Conducting system

(c) Separate gametophytes

(d) Archegonia

Q. 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)

Q. 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)

Q. 135. The phenomenon of change in colour of algae, according to depth in sea is called as:

(a) Pasteur's effect (b) Fogg's effect

(c) Bohr's effect   (d) Gaudikov's effect

SECTION B
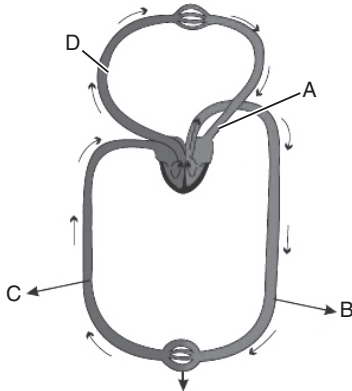
Q. 136. Specialised epidermal cells surrounding the guard cells are called:

(a) Lenticels

(b) Complimentary cells

(c) Subsidiary cells

(d) Bulliform cells

Q. 137. Global agreement to reduce the release of ODS is:

(a) Vienna Convention

(b) Rio de Janeiro Conference

(c) Kyoto Protocol

(d) Montreal Protocol

Q. 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

Q. 139. Succession stages that occur in an aquatic habitat are called:

    (a) Xerosere   **(b)** Halosere

    (c) Hydrosere   **(d)** Lithosere

Q. 140. The essential element required for water splitting in photosynthesis leading to oxygen evolution is:

    (a) Mo   **(b)** Mn

    (c) Mg   **(d)** K

Q. 141. The propagation of large number of plants by tissue culture technique is called:

    (a) SCP   **(b)** Micropropagation

    (c) Biofortification **(d)** Selective breeding

Q. 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.

Q. 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.

Q. 144. With regard to the biological N_2-Fixation by *Rhizobium* in association with soyabean, which one of the following statements does not hold true?

    (a) Nitrogenase may require O_2 for its functioning.

    (b) Nitrogenase is Mo–Fe protein.

    (c) Leg-haemoglobin is a pink coloured pigment.

    (d) Nitrogenase helps to convert N_2 gas into two molecules of ammonia.

Q. 145. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of:

    (a) Multipotency   **(b)** Unipotency

    (c) Pluripotency   **(d)** Totipotency

Q. 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.

Q. 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

Q. 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

Q. 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%

Q. 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** 〉

Q. 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.

Q. 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

Q. 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

Q. 154. Which one is exclusive characteristic of living beings?

(a) Increase in mass from inside.

(b) Increase in mass both from outside and inside.

(c) Perception of events happening in environment and their memory.

(d) Isolated metabolic reactions occuring *in vitro*.

Q. 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.

Q. 156. Which one is not a feature of *Adamsia*?

(a) Metagenesis

(b) Gastrovascular cavity

(c) Diploblastic

(d) Cnidoblast

Q. 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

Q. 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

Q. 159. Which of the following is a non-medicated IUD?

(a) Lippe's loop

(b) Multiload - 375

(c) LNG - 20

(d) Progestasert

Q. 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.

Q. 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.

Q. 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 & Elastin

(c) RuBisCo & Collagen

(d) Collagen and RuBisCO

Q. 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.

Q. 164. Select the Taxon mentioned which represent both marine and fresh water species.

(a) Echinoderms

(b) Ctenophora

(c) Cephalochordata

(d) Cnidaria

Q. 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

Q. 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*

Q. 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.

Q. 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.

Q. 169. A plover bird and crocodiles have a particular interaction, that is:

(a) Commensalism

(b) Protocooperation

(c) Mutualism

(d) Competition

Q. 170. In counter current mechanism, the concentration gradient in the medullary interstitium is mainly maintained by

(a) HCO_3^- & K^+

(b) NaCl and H_2O

(c) NaCl and urea

(d) K^+ and H^+

Q. 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.

Q. 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.

Q. 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.

Q. 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.

Q. 175. Hypothalmic hormones are transported to neurohypophysis through:

(a) Portal vein   (b) Portal artery

(c) Axons   (d) Lymph vessel

Q. 176. Lacteals collect lymph from:

(a) Lower limbs   (b) Upper limbs

(c) Gut   (d) Head

Q. 177. Choose the correct statement regarding mode of transmission of HIV?

(a) Drug addicts have least chance to infected with AIDS.

(b) Individuals who need repeated blood transfusion, HIV can be transmitted on sharing needles.

(c) Contaminated through saliva.

(d) Biting through contaminated mosquito.

Q. 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

Q. 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^-.

Q. 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.

Q. 181. If one kidney is removed what will be the immediate effect?

(a) The person will die due to lack of urine formation.

(b) Uraemia and death.

(c) Death due to poisoning.

(d) The person may survive.

Q. 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

Q. 183. The cartilage generally present on long bone terminals is:

(a) Hyaline cartilage

(b) Fibrous cartilage

(c) Hyaline and calcified cartilage

(d) Elastic cartilage

Q. 184. Poikilothermic animals having monocondylic skull and amnion belong to the class:

(a) Amphibia   (b) Reptilia

(c) Aves   (d) Mammalia

Q. 185. Name the cytokines which released in response to virus infection.

(a) Monokines   (b) Lymphokines

(c) Interleukins   (d) Interferons

SECTION B

Q. 186. The enzyme that is not present in succus entericus is:

(a) Maltase   (b) Nucleases

(c) Nucleosidase   (d) Lipase

Q. 187. Which of the following pairs is incorrectly matched?

(i) *Amoeba* – Fission

(ii) Filamentous algae – Fragmentation

(iii) *Planaria* – Budding

(iv) Parrot – True regeneration

(a) (i) and (ii)   (b) Both (i) and (iii)

(c) Only (ii)   (d) Both (iii) and (iv)

Q. 188. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:

(a) p^2 (b) $2pq$

(c) pq (d) q^2

Q. 189. Fructose is absorbed into the blood through mucosa cells of intestine by the process called:

(a) Active transport

(b) Facilitated transport

(c) Simple diffusion

(d) Co-transport mechanism

Q. 190. Volume of air that will remain in the lungs after a normal expiration is:

(a) FRC   (b) VC

(c) ERV   (d) IRV

Q. 191. The diagram given here is the standard ECG of a normal person. The P-wave represents the:
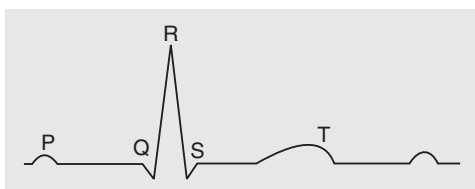
(a) Contraction of both atria

(b) Initiation of the ventricular contraction

(c) Beginning of the systole

(d) End of the systole

Q. 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

Q. 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

Q. 194. The process of becoming human or the development of human race is known as:

(a) Anthropogenesis

(b) Anthropology

(c) Anthropogeny

(d) Paleontology

Q. 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

Q. 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

Q. 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

Q. 198. In Human Genome Project, sequence of which chromosome was completed in May, 2006:
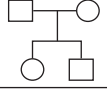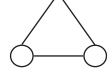
(a) Chromosome X

(b) Chromosome Y

(c) Chromosome 1

(d) Chromosome II

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

Kingdom   Animalia

Levels   'A'   Tissue/
of   Organ
organisation   system

Symmetry   Radial   'B'

Body Cavity   Acoelomates Pseudo-   'C'
or Coelom   coelomates
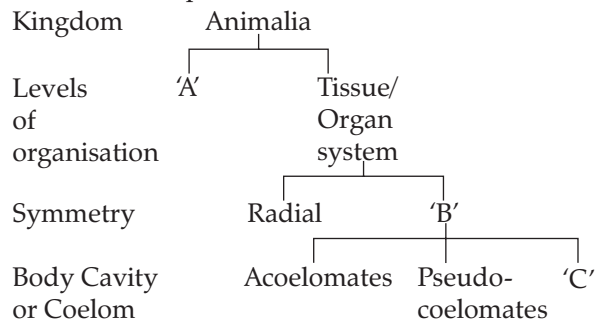
	A	B	C
(a)	Cellular	Bilateral	Coelomates
(b)	Cellular	Asymmetry	Eucoelomates
(c)	Cellular	Asymmetry	Enterocoelomate
(d)	Schizo cellular	Biradial	Coelomates

Q. 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)

Booklet Batch RollNumber

Ⓐ 10+1 Ⓢ
Ⓑ 10-2 Ⓥ
Ⓒ 10-3 Ⓐ
Ⓓ Crash Ⓒ
Ⓔ
Ⓕ Paper
Ⓖ
Ⓗ Paper 1 ①
Ⓘ Paper 2 ②
Ⓙ

Name

Test Date

Invigilator's Signature

Student's Signature

Certified that all the entries In this section have been properly filled by the student

The OMR Sheet will be computer checked Fill the circles completely and dark enough for proper detection, Use ballpen (black or blue) for marking.

Avoid Improper Marking

Partially Filled

Lightly Filled

Test Center Code

The answer grid contains questions numbered 1 to 200, each with answer options ⓐ ⓑ ⓒ ⓓ.

ANSWER KEY (SQP-1)

Physics

1.	(b)	14.	(b)	27.	(c)	40.	(b)
2.	(b)	15.	(d)	28.	(b)	41.	(b)
3.	(b)	16.	(c)	29.	(c)	42.	(d)
4.	(c)	17.	(b)	30.	(c)	43.	(b)
5.	(b)	18.	(a)	31.	(c)	44.	(b)
6.	(c)	19.	(c)	32.	(b)	45.	(a)
7.	(a)	20.	(a)	33.	(c)	46.	(c)
8.	(c)	21.	(b)	34.	(d)	47.	(d)
9.	(b)	22.	(b)	35.	(a)	48.	(c)
10.	(b)	23.	(b)	36.	(b)	49.	(c)
11.	(c)	24.	(c)	37.	(a)	50.	(d)
12.	(d)	25.	(d)	38.	(b)		
13.	(c)	26.	(d)	39.	(a)		

Botany

101.	(d)	114.	(c)	127.	(a)	140.	(b)
102.	(b)	115.	(b)	128.	(b)	141.	(b)
103.	(b)	116.	(d)	129.	(b)	142.	(b)
104.	(c)	117.	(a)	130.	(b)	143.	(c)
105.	(c)	118.	(b)	131.	(d)	144.	(a)
106.	(a)	119.	(b)	132.	(b)	145.	(d)
107.	(a)	120.	(c)	133.	(d)	146.	(c)
108.	(a)	121.	(c)	134.	(d)	147.	(b)
109.	(c)	122.	(a)	135.	(d)	148.	(a)
110.	(b)	123.	(b)	136.	(c)	149.	(a)
111.	(c)	124.	(a)	137.	(d)	150.	(b)
112.	(d)	125.	(b)	138.	(b)		
113.	(a)	126.	(b)	139.	(c)		

Chemistry

51.	(d)	64.	(d)	77.	(d)	90.	(a)
52.	(b)	65.	(c)	78.	(c)	91.	(b)
53.	(c)	66.	(a)	79.	(c)	92.	(a)
54.	(c)	67.	(d)	80.	(d)	93.	(c)
55.	(d)	68.	(d)	81.	(b)	94.	(b)
56.	(a)	69.	(c)	82.	(c)	95.	(c)
57.	(a)	70.	(d)	83.	(c)	96.	(d)
58.	(c)	71.	(a)	84.	(d)	97.	(a)
59.	(a, d)	72.	(d)	85.	(c)	98.	(a)
60.	(a)	73.	(c)	86.	(c)	99.	(a)
61.	(c)	74.	(b)	87.	(d)	100.	(c)
62.	(c)	75.	(d)	88.	(a)		
63.	(d)	76.	(a)	89.	(c)		

Zoology

151.	(b)	164.	(d)	177.	(b)	190.	(a)
152.	(a)	165.	(c)	178.	(d)	191.	(a)
153.	(c)	166.	(d)	179.	(a)	192.	(b)
154.	(c)	167.	(c)	180.	(b)	193.	(c)
155.	(d)	168.	(c)	181.	(d)	194.	(a)
156.	(a)	169.	(b)	182.	(c)	195.	(a)
157.	(a)	170.	(c)	183.	(a)	196.	(d)
158.	(a)	171.	(d)	184.	(b)	197.	(b)
159.	(a)	172.	(c)	185.	(d)	198.	(c)
160.	(a)	173.	(a)	186.	(b)	199.	(a)
161.	(d)	174.	(b)	187.	(d)	200.	(a)
162.	(d)	175.	(c)	188.	(b)		
163.	(d)	176.	(c)	189.	(b)		