

TEST 1

NEET - 2025

Time : 3 hours

Max. Marks : 720

Important Instructions:

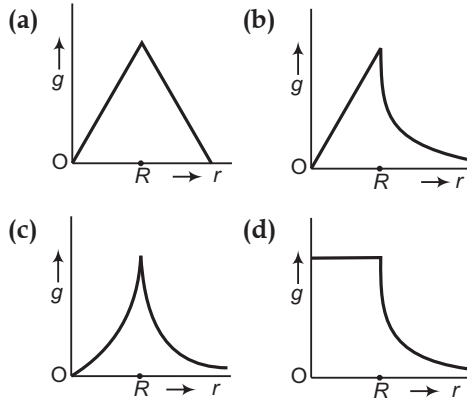
1. There are 180 questions in this test
2. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered/Unattempted questions will be given no marks.
3. Use Blue/Black Ball point pen any for writing particulars on this page/marking responses.
4. Use of Electronic/Manual calculator is prohibited.

PHYSICS

- Q. 1.** A body projected vertically from the Earth reaches a height equal to the radius of the Earth before returning to Earth. The power exerted by gravitational force is greatest
- (a) at the highest position of the body.
 - (b) at the instant just before the body hits the earth.
 - (c) it remains constant all through.
 - (d) at the instant just after the body is projected.
- Q. 2.** A transformer having efficiency of 90% is working on 200 V and 3 kW power supply. If the current in the secondary coil is 6 A, the voltage across the secondary coil and the current in the primary coil respectively are
- (a) 450 V, 13.5 A
 - (b) 600 V, 15 A
 - (c) 300 V, 15 A
 - (d) 450 V, 15 A
- Q. 3.** A converging beam of rays is incident on a diverging lens. Having passed through the lens the rays intersect at a point 15 cm from the lens on the opposite side. If the lens is removed the point where the rays meet will move 5 cm closer to the lens. The focal length of the lens is:
- (a) -10 cm
 - (b) 20 cm
 - (c) -30 cm
 - (d) 5 cm
- Q. 4.** Consider a system of two particles having masses m_1 and m_2 . If the particle of mass m_1 is pushed towards the centre of mass of particles through a distance d , by what distance would the particle of mass m_2 move so as to keep the centre of mass of particles at the original position?
- (a) $\frac{m_2}{m_1} d$
 - (b) $\frac{m_1}{m_1 + m_2} d$
 - (c) $\frac{m_1}{m_2} d$
 - (d) d
- Q. 5.** The capacity of a parallel plate condenser is 5 μF . When a glass plate is placed between the plates of the conductor, its potential becomes $1/8^{\text{th}}$ of the original value. The value of dielectric constant will be :
- (a) 1.6
 - (b) 5
 - (c) 8
 - (d) 40
- Q. 6.** The energy of a photon is $E = h\nu$ and the momentum of photon $p = h/\lambda$, then the velocity of photon will be:

- (a) E/p (b) Ep
 (c) $(Ep)^2$ (d) $3 \times 10^8 \text{ m/s}$

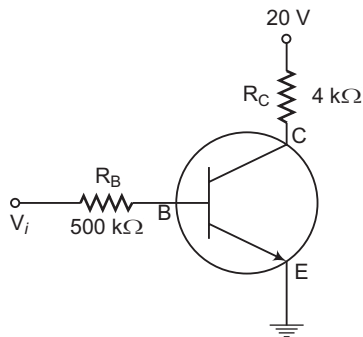
Q. 7. Starting from the centre of the Earth the variation of g (acceleration due to gravity) with I/F (distance from the center of the Earth) is shown by (R is the radius of the Earth):



Q. 8. Two identical long conducting wires AOB and COD are placed at right angle to each other, with one above other such that 'O' is their common point. The wires carry I_1 and I_2 currents, respectively. Point 'P' is lying at distance ' d ' from 'O' along a direction perpendicular to the plane containing the wires. The magnetic field at the point 'P' will be:

- (a) $\frac{\mu_0}{2\pi d} \times \frac{I_1}{I_2}$ (b) $\frac{\mu_0}{2\pi d} (I_1 + I_2)$
 (c) $\frac{\mu_0}{2\pi d} (I_1^2 - I_2^2)$ (d) $\frac{\mu_0}{2\pi d} (I_1^2 + I_2^2)^{1/2}$

Q. 9. In the circuit shown in the figure, the input voltage V_i is 20V, $V_{BE} = 0$ and $V_{CE} = 0$. The values of I_B , I_C and β are given by:

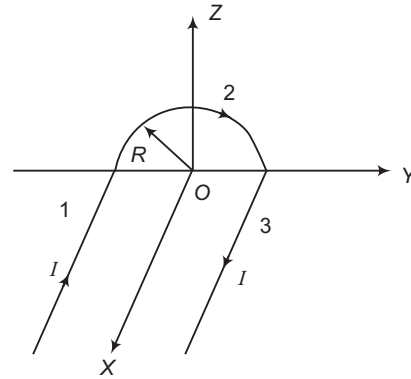


- (a) $I_B = 20 \mu\text{A}$, $I_C = 5 \text{ mA}$, $\beta = 250$
 (b) $I_B = 25 \mu\text{A}$, $I_C = 5 \text{ mA}$, $\beta = 200$
 (c) $I_B = 40 \mu\text{A}$, $I_C = 10 \text{ mA}$, $\beta = 250$
 (d) $I_B = 40 \mu\text{A}$, $I_C = 5 \text{ mA}$, $\beta = 125$

Q. 10. An electric dipole is kept in a non-uniform electric field. It experiences

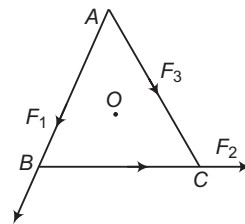
- (a) A force and a torque
 (b) A force but not a torque
 (c) A torque but not a force
 (d) Neither a force nor a torque

Q. 11. A wire carrying current I has the shape as shown in adjoining figure. Linear parts of the wire are very long and parallel to X-axis while semicircular portion of radius R is lying in Y-Z plane. Magnetic field at point O is:



- (a) $\vec{B} = -[\mu_0/4\pi \times I/R](\pi\hat{i} + 2\hat{k})$
 (b) $\vec{B} = -[\mu_0/4\pi \times I/R](\pi\hat{i} + 2\hat{k})$
 (c) $\vec{B} = [\mu_0/4\pi \times I/R](\pi\hat{i} - 2\hat{k})$
 (d) $\vec{B} = [\mu_0/4\pi \times I/R](\pi\hat{i} + 2\hat{k})$

Q. 12. O is the centre of an equilateral triangle ABC. F_1 , F_2 and F_3 are three forces acting along the sides AB, BC and AC as shown here. What should be the magnitude of F_3 , so that the total torque about O is zero?



- (a) $(F_1 + F_2)/2$ (b) $2(F_1 + F_2)$
 (c) $(F_1 + F_2)$ (d) $(F_1 - F_2)$

Q. 13. If the distance between parallel plates of a capacitor is halved and dielectric constant is doubled then the capacitance :

- (a) Decreases two times
 (b) Increases two times
 (c) Increases four times
 (d) Remains the same

Q. 14. A particle of unit mass undergoes one dimensional motion such that its velocity varies according to $v(x) = \beta x^{-2n}$, where β and n are constants and x is the position of the particle. The acceleration of the particle as a function of x is given by:

- (a) $-2\beta^2 x^{2n+1}$ (b) $-2n\beta^2 e^{-4n+1}$
(c) $-2n\beta^2 x^{2n-1}$ (d) $-2n\beta^2 x^{-4n-1}$

Q. 15. An ideal gas heat engine operates in Carnot cycle between 227°C and 127°C . It absorbs 6×10^4 cal of heat at higher temperature. Amount of heat converted to work is:

- (a) 2.4×10^4 cal (b) 6×10^4 cal
(c) 1.2×10^4 cal (d) 4.8×10^4 cal

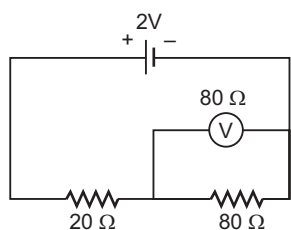
Q. 16. A homogeneous disc of mass 2 kg and radius 15 cm is rotating about its axis (which is fixed) with an angular velocity of 4 rad/s. The linear momentum of the disc is:

- (a) 1.2 kg m/s (b) 1.0 kg m/s
(c) 0.6 kg m/s (d) none of these

Q. 17. A bullet of mass 10 g leaves a rifle at an initial velocity of 1000 m/s and strikes the target at the same level with a velocity of 500 m/s. The work done in joules overcoming the resistance of air will be:

- (a) 375 (b) 3750
(c) 5000 (d) 500

Q. 18. In the adjoining circuit, the e.m.f. of the cell is 2 volt and the internal resistance is negligible. The resistance of the voltmeter is 80 ohm. The reading of the voltmeter will be:



- (a) 0.80 volt (b) 1.60 volt
(c) 1.33 volt (d) 2.00 volt

Q. 19. A nucleus ruptures into two nuclear parts, which have their velocity ratio equal to 2 : 1. What will be the ratio of their nuclear size (nuclear radius)?

- (a) $2^{1/3} : 1$ (b) $1 : 2^{1/3}$
(c) $3^{1/2} : 1$ (d) $1 : 3^{1/2}$

Q. 20. A thin transparent sheet is placed in front of a Young's double slit. The fringe-width will:

- (a) increase
(b) decrease
(c) remain same
(d) become non-uniform

Q. 21. Expansion during heating:

- (a) Occurs only in solids
(b) Increases the weight of a material
(c) Decreases the density of a material
(d) Occurs at the same rate for all liquids and solids

Q. 22. A linear aperture whose width is 0.02 cm is placed in front of a lens of focal length 60 cm. The aperture is illuminated normally by a parallel beam of wavelength 5×10^{-5} cm. The distance of the first dark band of the diffraction pattern from the centre of the screen is:

- (a) 0.10 cm (b) 0.25 cm
(c) 0.20 cm (d) 0.15 cm

Q. 23. Two radioactive elements A (80 g) and B (320 g) with Half lives 40 s and 20 s respectively are kept in a glass chamber. After a time interval ' t ', their masses are found to be equal. Then t in seconds is

- (a) 40 s (b) 60 s
(c) 80 s (d) 100 s

Q. 24. Which of the following is a FALSE statement?

- (a) Heat is the energy transferred into or out of a system as a result of a temperature difference between the system and its surroundings.
(b) The heat added to an ideal gas during the transition from state 1 to state 2 depends only on the initial and final states, 1 and 2, and not on the path by which the gas went from one to the other.
(c) When a gas goes from one state to another, the work done depends on the path followed.
(d) It does not make sense to refer to "the amount of heat in a body".

Q. 25. A uniform force of $3\hat{i} + \hat{j}$ newton acts on a particle of mass 2 kg. Hence the particle is displaced from position $2\hat{i} + \hat{k}$ metre to

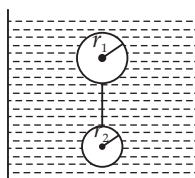
position $4\hat{i} + 3\hat{j} - \hat{k}$ metre. The work done by the force on the particle is:

- (a) 9 J (b) 6 J
(c) 13 J (d) 15 J

Q. 26. Energy released in the fission of a single nucleus ${}_{92}\text{U}^{235}$ is 200 MeV. The fission rate of a ${}_{92}\text{U}^{235}$ fuelled reactor operating at a power level of 5 MW is

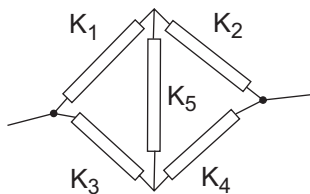
- (a) $1.56 \times 10^{10}/\text{s}$ (b) $1.56 \times 10^{11}/\text{s}$
(c) $1.56 \times 10^{16}/\text{s}$ (d) $1.56 \times 10^{17}/\text{s}$

Q. 27. Two solid spherical balls of radius r_1 & r_2 ($r_2 < r_1$), and density σ are tied up with a string and released in a viscous liquid of lesser density ρ and coefficient of viscosity η , with the string just taut as shown. The terminal velocity of spheres is :



- (a) $\frac{2}{9} \frac{r_2^3 g}{\eta} (\sigma - \rho)$
(b) $\frac{2}{9} \frac{r_1^3 g}{\eta} (\sigma - \rho)$
(c) $\frac{2}{9} \frac{(r_1^3 + r_2^3) (\sigma - \rho) g}{r_1 + r_2 \eta}$
(d) $\frac{2}{9} \frac{(r_1^3 - r_2^3) (\sigma - \rho) g}{r_1 - r_2 \eta}$

Q. 28. Five rods of same dimensions are arranged.



They have thermal conductivities K_1 , K_2 , K_3 , K_4 and K_5 . When the points A and B are maintained at different temperatures, no heat flows through the central rod if

- (a) $K_1 \cdot K_4 = K_2 \cdot K_3$ (b) $K_1 \cdot K_2 = K_3 \cdot K_4$
(c) $K_1 = K_4$ (d) $K_3 = K_2$

Q. 29. The depletion layer in the p - n junction region is caused by:

- (a) drift of holes
(b) diffusion of charge carriers

- (c) migration of impurity ions
(d) drift of electrons

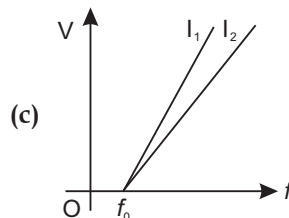
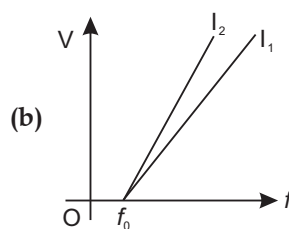
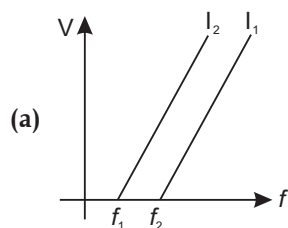
Q. 30. The ratio of diameters of two wires of same material in $n : 1$. The length of each wire is 4 m. On applying the same load, the increase in the length of the thin wire will be ($n > 1$):

- (a) n^2 times (b) n times
(c) $2n$ times (d) $(2n + 1)$ times

Q. 31. A thin horizontal circular disc is rotating about a vertical axis passing through its centre. An insect is at a point near the rim of the disc. The insect now moves along a diameter of the disc to reach its other end. During the journey of the insect, the angular speed of the disc :

- (a) Continuously decreases
(b) Continuously increases
(c) First increases and then decreases
(d) Remains unchanged

Q. 32. A photoelectric experiment is performed at two different light intensities I_1 and I_2 ($I_2 > I_1$). Choose the correct graph showing the variation of stopping potential versus frequency of light.



- (d) None of these

Q. 33. The potential energy of a particle of mass 0.5 kg moving in the X - Y plane is given by $U = (5.5x - 7y)$ joule, x and y being in metre. If the particle starts from rest, the speed of the particle at time $t = 4$ s is nearly

- (a) 40.5 m/s (b) 71.2 m/s
(c) 54.0 m/s (d) 45.0 m/s
- Q. 34.** An object and a screen are separated by an axial distance of 40 cm. A convex lens of focal length 9 cm forms two real images on screen at two co-axial positions separated by 'd' cm. Then d is equal to
(a) $\sqrt{10}$ (b) $2\sqrt{10}$
(c) $3\sqrt{10}$ (d) $4\sqrt{10}$
- Q. 35.** A motorcycle is travelling on a curved track of radius 500 m if the coefficient of friction between road and tyres is 0.5. The speed for avoiding skidding will be:
(a) 50 m/s (b) 75 m/s
(c) 25 m/s (d) 35 m/s
- Q. 36.** A certain number of spherical drops of a liquid of radius 'r' coalesce to form a single drop of radius 'R' and volume 'V'. If 'T' is the surface tension of the liquid, then:
(a) energy = $4VT(1/r - 1/R)$ is released
(b) energy = $3VT(1/r + 1/R)$ is absorbed
(c) energy = $3VT(1/r - 1/R)$ is released
(d) energy is neither released nor absorbed
- Q. 37.** The voltage amplification factor of a CE amplifier is 100. If the voltage across collector resistance of 2000 ohms is 2 V, and if the input resistance is 1000 ohms, the input current is
(a) 2 μ A (b) 0.2 μ A
(c) 20 μ A (d) 200 μ A
- Q. 38.** Two uniform brass rods P and Q of length L and 3L and radii 3R and R respectively are heated to the same temperature. The ratio of increase in volume of P to that of Q is:
(a) 1 : 1 (b) 1 : 2
(c) 3 : 1 (d) 1 : 3
- Q. 39.** A black body radiates energy at the rate of $E \text{ W/m}^2$ at a temperature T K. When the temperature is reduced to $T/2$ K, the radiant energy will be:
(a) $E/16$ (b) $E/4$
(c) 4E (d) 16E
- Q. 40.** The magnetic flux linked with a coil, in webers, is given by the equation $\phi = 3t^2 + 4t + 9$. Then the magnitude of induced e.m.f. at $t = 2$ second will be:
(a) 2 volt (b) 4 volt
(c) 8 volt (d) 16 volt
- Q. 41.** When 97.52 is divided by 2.54, the correct result is
(a) 38.3937 (b) 38.394
(c) 65.81 (d) 38.4
- Q. 42.** A ball is projected from ground with a speed of 20 m/s at an angle of 45° with horizontal. There is a wall of 25 m height at a distance of 10 m from the point of projection. The ball will hit the wall at a height of:
(a) 10 m (b) 7.5 m
(c) 5 m (d) 12.5 m
- Q. 43.** A ball suspended by a thread swings in a vertical plane so that its acceleration in the extreme position and the lowest position are equal. The angle θ of thread at extreme position will be:
(a) $\tan^{-1}(2)$ (b) $\tan^{-1}(\sqrt{2})$
(c) $\tan^{-1}\left(\frac{1}{2}\right)$ (d) $2 \tan^{-1}\left(\frac{1}{2}\right)$
- Q. 44.** A simple harmonic oscillator consists of a particle of mass M and a spring of force constant K. The particle oscillates with a period T. If the spring is cut into two equal parts and connected in parallel with the same block, the new time period will be:
(a) $\sqrt{2} T$ (b) $\frac{T}{\sqrt{2}}$
(c) 2 T (d) $\frac{T}{2}$
- Q. 45.** A whistle with frequency 1020 Hz is blown at a station. A man travelling in the train towards the station at speed of 30 m/s hears the sound of whistle. If speed of sound in air is 340 m/s, the apparent frequency heard is
(a) 1020 Hz (b) 1110 Hz
(c) 2040 Hz (d) 610 Hz

CHEMISTRY

Q. 46. In which of the following pairs, the two species are isostructural?

- (a) SF_4 and XeF_4 (b) SO_3^{2-} and NO_3^-
 (c) BF_3 and NF_3 (d) BrO_3^- and XeO_3

Q. 47. Which one is the correct order of acidity?

- (a) $\text{CH}_2=\text{CH}_2 > \text{CH}_3-\text{CH}=\text{CH}_2 > \text{CH}_3-\text{C}\equiv\text{CH} > \text{CH}\equiv\text{CH}$
 (b) $\text{CH}\equiv\text{CH} > \text{CH}_3-\text{C}\equiv\text{CH} > \text{CH}_2=\text{CH}_2 > \text{CH}_3-\text{CH}_3$
 (c) $\text{CH}\equiv\text{CH} > \text{CH}_2=\text{CH}_2 > \text{CH}_3-\text{C}\equiv\text{CH} > \text{CH}_3-\text{CH}_3$
 (d) $\text{CH}_3-\text{CH}_3 > \text{CH}_2=\text{CH}_2 > \text{CH}_3-\text{C}\equiv\text{CH} > \text{CH}\equiv\text{CH}$

Q. 48. The geometry and magnetic behaviour of the complex $[\text{Ni}(\text{CO})_4]$ are :

- (a) Square planar geometry and paramagnetic
 (b) Tetrahedral geometry and diamagnetic
 (c) Square planar geometry and diamagnetic
 (d) Tetrahedral geometry and paramagnetic

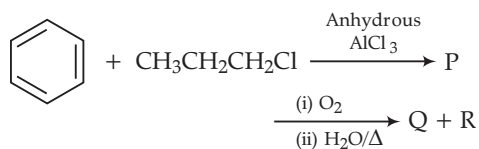
Q. 49. Given van der Waals constant for NH_3 , H_2 and CO_2 are respectively 4.17, 0.244, 1.36 and 3.59, which one of the following gases is most easily liquefied?

- (a) NH_3 (b) H_2
 (c) O_2 (d) CO_2

Q. 50. Which one of the following is incorrect for ideal solution?

- (a) $\Delta H_{\text{mix}} = 0$
 (b) $\Delta U_{\text{mix}} = 0$
 (c) $\Delta P = P_{\text{obs}} - P_{\text{calculated by Raoult's law}} = 0$
 (d) $\Delta G_{\text{mix}} = 0$

Q. 51. Identify the major products P, Q and R in the following sequence of reactions:



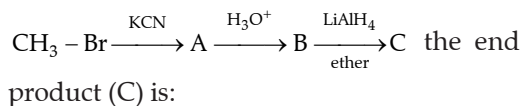
- (a) P, Q, R
 (b) P, Q, R
 (c) P, Q, R
 (d) P, Q, R

Q. 52. The value of Planck's constant is 6.63×10^{-34} Js. The speed of light is 3×10^{17} nm s^{-1} . Which value is closest to the wavelength in nanometer of a quantum of light with frequency of 6×10^{15} s^{-1} ?

- (a) 10 (b) 25
 (c) 50 (d) 75

- Q. 53.** Lithium has a *bcc* structure. Its density is 530 kg m^{-3} and its atomic mass is 6.94 g mol^{-1} . Calculate the edge length of a unit cell of lithium metal. [$N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$]
- (a) 527 pm (b) 264 pm
(c) 154 pm (d) 352 pm
- Q. 54.** Correct increasing order for the wavelengths of absorption in the visible region for the complexes of Co^{3+} is:
- (a) $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
(b) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$
(c) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$
(d) $[\text{Co}(\text{NH}_3)_6]^{3+}$, $[\text{Co}(\text{en})_3]^{3+}$, $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
- Q. 55.** Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2 . When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are :
- (a) 40, 30 (b) 60, 40
(c) 20, 30 (d) 30, 20
- Q. 56.** The correct order of catenation is:
- (a) $\text{C} > \text{Sn} > \text{Si} \approx \text{Ge}$
(b) $\text{Si} > \text{Sn} > \text{C} > \text{Ge}$
(c) $\text{C} > \text{Si} > \text{Ge} \approx \text{Sn}$
(d) $\text{Ge} > \text{Sn} > \text{Si} > \text{C}$
- Q. 57.** The correct increasing order of trans-effect of the following species is:
- (a) $\text{NH}_3 > \text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^-$
(b) $\text{CN}^- > \text{C}_6\text{H}_5^- > \text{Br}^- > \text{NH}_3$
(c) $\text{Br}^- > \text{CN}^- > \text{NH}_3 > \text{C}_6\text{H}_5^-$
(d) $\text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^- > \text{NH}_3$
- Q. 58.** Decreasing order of stability of O_2 , O_2^- , O_2^+ and O_2^{2-} is:
- (a) $\text{O}_2^{2-} > \text{O}_2^- > \text{O}_2 > \text{O}_2^+$
(b) $\text{O}_2 > \text{O}_2^+ < \text{O}_2^{2-} > \text{O}_2^-$
(c) $\text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2$
(d) $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
- Q. 59.** Haemoglobin and gold sol are example of :
- (a) negatively and positively charged sols, respectively.
(b) negatively charged sols.
(c) positively charged sols.
(d) positively and negatively charged sols, respectively.
- Q. 60.** Because of lanthanoid contraction, which of the following pairs of elements have nearly same atomic radii?
- [Numbers in the parenthesis are atomic numbers].
- (a) Ti (22) and Zr (40)
(b) Zr (40) and Nb (41)
(c) Zr (40) and Hf (72)
(d) Zr (40) and Ta (73)
- Q. 61.** From the following bond energies:
- H-H bond energy : $431.37 \text{ kJ mol}^{-1}$
C=C bond energy : $606.10 \text{ kJ mol}^{-1}$
C-C bond energy : $336.49 \text{ kJ mol}^{-1}$
C-H bond energy : $410.50 \text{ kJ mol}^{-1}$
- Enthalpy for the reaction,
- $$\begin{array}{c} \text{H} & \text{H} \\ | & | \\ \text{C} = & \text{C} + \text{H} - \text{H} \longrightarrow \text{H} - \text{C} - \text{C} - \text{H} \\ | & | \\ \text{H} & \text{H} \end{array}$$
- will be :
- (a) $1523.6 \text{ kJ mol}^{-1}$
(b) $-243.6 \text{ kJ mol}^{-1}$
(c) $-120.0 \text{ kJ mol}^{-1}$
(d) $553.0 \text{ kJ mol}^{-1}$
- Q. 62.** In $\text{S}_{\text{N}}1$ reaction, on chiral centres, there is:
- (a) inversion more than retention leading to partial racemisation
(b) 100% retention
(c) 100% inversion
(d) 100% racemisation
- Q. 63.** Which of the following can be used as the halide component for Friedel-Crafts reaction?
- (a) Chlorobenzene
(b) Bromobenzene
(c) Chloroethene
(d) Isopropyl chloride
- Q. 64.** The freezing point depression constant for water is $1.86^\circ\text{C mol}^{-1} \text{ kg}$. If 5.00 g Na_2SO_4 is dissolved in 45.0 g H_2O , the freezing point is changed by -3.82°C . Calculate the van't Hoff factor for Na_2SO_4 .
- (a) 2.63 (b) 3.11
(c) 0.381 (d) 2.05

Q. 65. In the following sequence of reactions

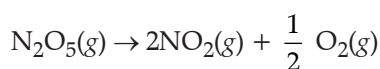


- (a) acetone (b) methane
(c) acetaldehyde (d) ethyl alcohol

Q. 66. The sum of coordination number and oxidation number of the metal M in the complex $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{Cl}$ (where en is ethylenediamine) is :

- (a) 9 (b) 6
(c) 7 (d) 8

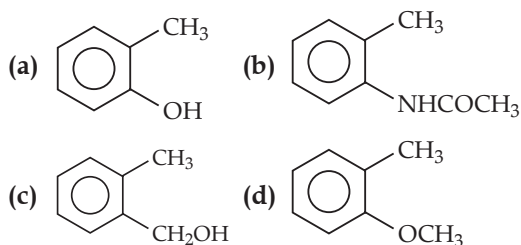
Q. 67. For the reaction,



The value of rate of disappearance of N_2O_5 is given as $6.25 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$. The rate of formation of NO_2 and O_2 is given respectively as:

- (a) $6.25 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$ and $6.25 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$
(b) $1.25 \times 10^{-2} \text{ mol L}^{-1}\text{s}^{-1}$ and $3.125 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$
(c) $6.25 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$ and $3.125 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$
(d) $1.25 \times 10^{-2} \text{ mol L}^{-1}\text{s}^{-1}$ and $6.25 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$

Q. 68. Which one of the following is most reactive towards electrophilic reagent:



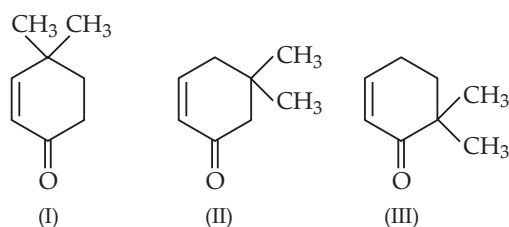
Q. 69. Which of the following are not state functions?

- (I) $q + W$ (II) q
(III) W (IV) $H - TS$
(a) I and IV (b) II, III and IV
(c) I, II and III (d) II and III

Q. 70. In which of the following compounds, nitrogen exhibits highest oxidation state?

- (a) N_2H_4 (b) NH_3
(c) N_3H (d) NH_2OH

Q. 71. Given,



Which of the given compounds can exhibit tautomerism?

- (a) I and II (b) I and III
(c) II and III (d) I, II and III

Q. 72. For the reduction of silver ions with copper metal the standard cell potential was found to be + 0.46 V at 25°C. The value of standard Gibbs energy, ΔG° will be : ($F = 96500 \text{ C mol}^{-1}$)

- (a) -89.0 kJ (b) -89.0 J
(c) -44.5 kJ (d) -98.0 kJ

Q. 73. The oxidation state of sulphur in the anions SO_3^{2-} , $\text{S}_2\text{O}_4^{2-}$ and $\text{S}_2\text{O}_6^{2-}$ follow the order:

- (a) $\text{S}_2\text{O}_4^{2-} < \text{SO}_3^{2-} < \text{S}_2\text{O}_6^{2-}$
(b) $\text{SO}_3^{2-} < \text{S}_2\text{O}_4^{2-} < \text{S}_2\text{O}_6^{2-}$
(c) $\text{S}_2\text{O}_4^{2-} < \text{S}_2\text{O}_6^{2-} < \text{SO}_3^{2-}$
(d) $\text{S}_2\text{O}_6^{2-} < \text{S}_2\text{O}_4^{2-} < \text{SO}_3^{2-}$

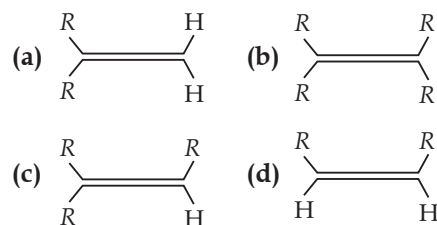
Q. 74. The correct order of increasing thermal stability of K_2CO_3 , MgCO_3 , CaCO_3 and BeCO_3 is:

- (a) $\text{BeCO}_3 < \text{MgCO}_3 < \text{K}_2\text{CO}_3 < \text{CaCO}_3$
(b) $\text{BeCO}_3 < \text{MgCO}_3 < \text{CaCO}_3 < \text{K}_2\text{CO}_3$
(c) $\text{MgCO}_3 < \text{BeCO}_3 < \text{CaCO}_3 < \text{K}_2\text{CO}_3$
(d) $\text{K}_2\text{CO}_3 < \text{MgCO}_3 < \text{CaCO}_3 < \text{BeCO}_3$

Q. 75. pH of 0.01 M $\text{Sr}(\text{OH})_2$ at 298K will be?

- (a) 2 (b) 1.7
(c) 12.3 (d) None of these

Q. 76. Which one of the following alkenes will react faster with H_2 under catalytic hydrogenation conditions? (R = alkyl substituent)



Q. 77. Which one of the following arrangements represents the correct order of electron gain

enthalpy (with negative sign) of the given atomic species?

- (a) $\text{Cl} < \text{F} < \text{S} < \text{O}$
- (b) $\text{O} < \text{S} < \text{F} < \text{Cl}$
- (c) $\text{S} < \text{O} < \text{Cl} < \text{F}$
- (d) $\text{F} < \text{Cl} < \text{O} < \text{S}$

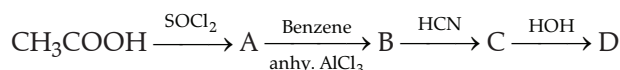
Q. 78. The enthalpy of fusion of water is 1.435 kcal/mole. The molar entropy change for the melting of ice at 0°C is:

- (a) 10.52 cal/mol K
- (b) 21.04 cal/mol K
- (c) 5.260 cal/mol K
- (d) 0.526 cal/mol K

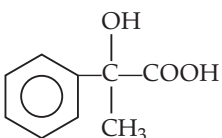
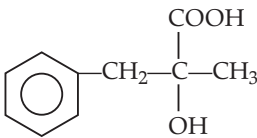
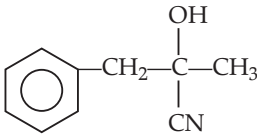
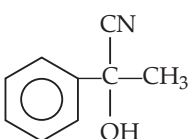
Q. 79. Fructose reduces Tollen's reagent due to:

- (a) asymmetric carbons
- (b) primary alcoholic group
- (c) secondary alcoholic group
- (d) enolisation of fructose followed by conversion to aldehyde by base.

Q. 80. In a set of reactions, acetic acid yielded a product D.



The structure of D would be :

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

Q. 81. Green chemistry means such reactions which:

- (a) are related to the depletion of ozone layer.

- (b) study the reaction in plants.
- (c) produce colour during reactions.
- (d) reduce the use and production of hazardous chemicals.

Q. 82. Which one of the following is not a condensation polymer?

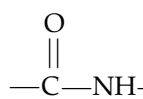
- (a) Melamine
- (b) Glyptal
- (c) Dacron
- (d) Neoprene

Q. 83. Which of the following pairs has the same size?

- (a) $\text{Fe}^{2+}, \text{Ni}^{2+}$
- (b) $\text{Zr}^{4+}, \text{Ti}^{4+}$
- (c) $\text{Zr}^{4+}, \text{Hf}^{4+}$
- (d) $\text{Zn}^{2+}, \text{Hf}^{4+}$

Q. 84. The correct order of acid strength is :

- (a) $\text{HClO}_4 < \text{HClO}_3 < \text{HClO}_2 < \text{HClO}$
- (b) $\text{HClO} < \text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$
- (c) $\text{HClO}_4 < \text{HClO} < \text{HClO}_2 < \text{HClO}_3$
- (d) $\text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4 < \text{HClO}$

Q. 85.  (peptide bond).

Which statement is incorrect about peptide bond?

- (a) C—N bond length in proteins is longer than usual bond length of N—C bond structure.
- (b) Spectroscopic analysis shows planar  group.

- (c) C—N bond length in proteins is smaller than usual bond length of C—N bond.
- (d) None of the above.

Q. 86. At constant pressure, the presence of argon at equilibrium of $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ will

- (a) reduce the formation of NH_3 .
- (b) increase the formation of NH_3 .
- (c) reduce the formation of NH_3 .
- (d) increase the formation of both N_2 and H_2 .

Q. 87. Given that $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80 \text{ V}$ and $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$. Which of the following statement is correct?

- (a) Ag^+ can reduced by H_2 .
- (b) Zn^{2+} can reduced by H_2 .
- (c) Ag can oxidise H_2 into H^+ .
- (d) Ag can reduce Zn^{2+} .

Q. 88. Given two statements

Statement 1: Steel and cast iron are hard due to the formation of an interstitial compound with carbon.

Statement 2: The transition elements form interstitial compound.

- (a) Statement 1 is incorrect but statement 2 is true.
- (b) Both statement 1 and statement 2 are true.
- (c) Both statement 1 and statement 2 are false.
- (d) Statement 1 is correct but statement 2 is false.

Q. 89. The correct order of basicity of amines $(\text{CH}_3)_3\text{N}$, $(\text{CH}_3)_2\text{NH}$, CH_3NH_2 and NH_3 in the gaseous phase is

- (a) $(\text{CH}_3)_3\text{N} > (\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > \text{NH}_3$
- (b) $\text{NH}_3 > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH} > (\text{CH}_3)_3\text{N}$
- (c) $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$
- (d) All these amines are equally basic.

Q. 90. Which of the following alcohols will dehydrate most rapidly when treated with H_2SO_4 .

- (a) *n*-butyl alcohol
- (b) sec-butyl alcohol
- (c) Isopropylmethyl carbinol
- (d) Isopropyldimethyl carbinol

BOTANY

Q. 91. Which one of the following statements about viruses is correct?

- (a) Viruses possess their own metabolic system.
- (b) Viruses contain either DNA or RNA.
- (c) Viruses are facultative parasites.
- (d) Viruses are readily killed by antibiotics.

Q. 92. During which phase(s) of cell cycle amount of DNA in a cell remains at 4C level if the initial amount is denoted at 2C?

- (a) G_1 and S
- (b) Only G_2
- (c) G_2 and M
- (d) G_0 and G_1

Q. 93. Keel is the characteristic feature of the flower of:

- (a) Lily
- (b) *Trifolium*
- (c) Potato
- (d) Chilli

Q. 94. The Taq polymerase enzyme is obtained from:

- (a) *Thiobacillus ferrooxidans*
- (b) *Bacillus subtilis*
- (c) *Pseudomonas putida*
- (d) *Thermus aquaticus*

Q. 95. Which of the following cell organelle help in osmoregulation in some protists?

- (a) Golgi apparatus
- (b) Contractile vacuoles
- (c) Mitochondrion
- (d) Sap vacuoles

Q. 96. Which of the following can be used as a biocontrol agent in the treatment of plant disease ?

- (a) *Chlorella*
- (b) *Anabaena*
- (c) *Lactobacillus*
- (d) *Trichoderma*

Q. 97. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

- (a) Gregor J. Mendel
- (b) Alfred Sturtevant
- (c) Sutton Boveri
- (d) T.H. Morgan

Q. 98. The biomolecule present in least quantity, among following, in a living cell are :

- (a) Proteins
- (b) Lipids
- (c) Carbohydrates
- (d) Nucleic acids

Q. 99. Closed vascular bundles lack:

- (a) Cambium
- (b) Pith
- (c) Ground tissue
- (d) Conjunctive tissue

- Q. 100.** Archegoniophore occurs in :
 (a) *Chara* (b) *Funaria*
 (c) *Adiantum* (d) *Marchantia*
- Q. 101.** In monocotyledonous seed, the plumule and radicle are enclosed in sheath which are called-----A----- and -----B----- respectively.
 (a) A – Coleorhiza, B – Coleoptile
 (b) A – Coleoptile, B – Coleorhiza
 (c) A – Coleorhiza, B – Epiblast
 (d) A – Coleoptile, B – Pericarp
- Q. 102.** Select the substrate with least R.Q.:
 (a) Glucose
 (b) Malic acid
 (c) Tripalmitic acid
 (d) Oxalic acid
- Q. 103.** Cyclic photophosphorylation differs from non-cyclic photophosphorylation as later involves :
 (i) Splitting of H_2O .
 (ii) Formation of $NADPH + H^+$.
 (iii) Formation of ATP.
 (iv) Requirement of external electron source.
 (a) Only (i) and (ii)
 (b) (i), (ii) and (iv)
 (c) Only (ii) and (iii)
 (d) Only (iii)
- Q. 104.** The role of auxin is to
 (a) Stimulate ripening of fruit.
 (b) Stimulate root formation on stem cuttings.
 (c) Inhibit apical dominance.
 (d) Increase the size of apple.
- Q. 105.** The arrangement of nuclei in normal dicot embryo sac is:
 (a) 3 + 3 + 2 (b) 2 + 4 + 2
 (c) 3 + 2 + 3 (d) 2 + 3 + 3
- Q. 106.** Select the mismatched pair:
 (a) Ascospore – Sexual spore
 (b) Basidiospore – Haploid spore
 (c) Conidia – Diploid spore
 (d) Sporangiospore – Asexual spore
- Q. 107.** Which of the following features given below are correct for coconut fruit?
 (i) Develop from monocarpellary ovary
 (ii) Fibrous mesocarp
 (iii) Formed from inferior ovary
 (iv) Hard stony endocarp
 (v) Edible mesocarp
 (a) i, iii and iv (b) iii, iv and v
 (c) ii, iii and iv (d) i, ii and iv
- Q. 108.** Select the correct statement:
 (a) Leaves of gymnosperms are not well adapted to extremes of climate.
 (b) Gymnosperms are both homosporous and heterosporous.
 (c) *Salvinia*, *Ginkgo* and *Pinus* are all gymnosperms.
 (d) *Sequoia* is one of the tallest trees.
- Q. 109.** Which of the following forest is known as the 'Lungs of the Planet Earth'?
 (a) Taiga Forest
 (b) Tundra Forest
 (c) Amazon Rain Forest
 (d) Rain forest of North East India
- Q. 110.** Taxonomic key is one of the taxonomic tools in the identification and classification of plants. It is used for the preparation of
 (a) Monographs
 (b) Flora
 (c) Both (a) and (b)
 (d) Museum
- Q. 111.** You design a circular ssDNA with a labeled RNA primer (alpha-P32 labeling). You add polymerase epsilon and required enzymes for replication to the fragment. What will you expect to see on autoradiography after gel electrophoresis:
 (a) Two labeled band one much lower than the other with labeling at the bottom region.
 (b) No band but labeling at the bottom.
 (c) Two labeled band one much lower than the other with no labeling at the bottom.
 (d) Single labeled band with some labeling at the bottom region.
- Q. 112.** Transition state structure of the substrate formed during an enzymatic reaction is:
 (a) Permanent but unstable.
 (b) Transient but unstable.

- (c) Permanent and stable.
- (d) Transient but stable.

Q. 113. Which one of the living organisms completely lacks a cell wall?

- (a) *Mycoplasma*
- (b) *Saccharomyces*
- (c) Blue-green algae
- (d) Cyanobacteria

Q. 114. Basis of DNA fingerprinting is :

- (a) Relative proportion of purines and pyrimidines.
- (b) Relative difference in DNA occurrence in blood, skin and saliva.
- (c) Relative amounts of DNA in ridges and grooves of fingerprints.
- (d) Satellite DNA occurring as highly repeated short DNA segments.

Q. 115. *Cuscuta* is an example of:

- (a) Endo-parasitism
- (b) Predation
- (c) Ecto-parasitism
- (d) Brood parasitism

Q. 116. The prothallus is:

- (a) A structure in pteridophyte which is always dioecious.
- (b) A sporophytic free living structure formed in pteridophytes.
- (c) A gametophytic, free living structure formed in pteridophytes.
- (d) A primitive structure formed after fertilization in Pteridophytes.

Q. 117. A particular species of plant produces light, nonsticky pollen in large numbers and its stigma is long and feathery. These modification facilitate pollination by:

- (a) Insects (b) Water
- (c) Wind (d) Animals

Q. 118. The first discovered restriction endonuclease was:

- (a) Eco RI (b) Hind II
- (c) Sal I (d) Sma I

Q. 119. In six kingdom classification, Monera was divided into two separate kingdoms on the basis of

- (1) Cell wall composition.
- (2) Lipid nature in plasma membrane.
- (3) Absence of sexual reproduction.

- (a) (1) only
- (b) (1) and (2) only
- (c) (2) and (3) only
- (d) All (1), (2) and (3)

Q. 120. Anaphase Promoting Complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur ?

- (a) Chromosomes will not condense.
- (b) Chromosomes will be fragmented.
- (c) Chromosomes will not segregate.
- (d) Recombination of chromosome arms will occur.

Q. 121. Which of the following statements is correct:

- (a) The hard outer layer of pollen is called intine.
- (b) Sporogenous tissue is haploid.
- (c) Microspores are produced by endothecium.
- (d) Tapetum nourishes the developing pollen.

Q. 122. Which of the following occurs in meiosis but not in mitosis :

- (a) Separation of sister chromatids at anaphase.
- (b) Pairing of homologous chromosomes at metaphase plate.
- (c) Replication of DNA prior to start of cell division.
- (d) Attachment of spindle fibers to kinetochore.

Q. 123. Replication of plasmid DNA other than initiation is controlled by:

- (a) Bacterial gene
- (b) Mitochondrial gene
- (c) Plasmid DNA
- (d) None of these

Q. 124. How many of the structures given in the box are haploid, diploid and triploid, respectively.

Pollen grain, megaspore, synergid, endosperm, meiocytes, secondary nucleus, ovary, anther, egg, zygote

- (a) 4, 5, 1 (b) 3, 5, 2
- (c) 6, 3, 1 (d) 7, 3, 0

Q. 125. Read the following statements and select the correct option.

Statement A: Complementary genes are two genes which are present on different loci. They independently show a similar effect but form a new trait when present together.

Statement B: Complementary gene interaction shows 9 : 3 : 3 : 1 ratio in F_2 -generation.

- (a) Only statement A is correct.
- (b) Only statement B is correct.
- (c) Both statements A and B are correct.
- (d) Both statements A and B are incorrect.

Q. 126. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of:

- (a) Chilli (b) Maize
- (c) Sugarcane (d) Wheat

Q. 127. The first stable product of fixation of atmospheric nitrogen in leguminous plants is:

- (a) NO_2^- (b) Ammonia
- (c) NO_3^- (d) Glutamate

Q. 128. Which one of the following statements for pyramid of energy is incorrect, whereas the remaining three are correct?

- (a) It is upright in shape.
- (b) Its base is broad.
- (c) It shows energy content of different trophic level organisms.
- (d) It is inverted in shape.

Q. 129. Select the incorrect match regarding plants and their mode of reproduction.

- (a) Rhizome – Banana
- (b) Offset – *Eichhornia*
- (c) Conidia – *Chlamydomonas*
- (d) Bulbil – *Oxalis*

Q. 130. Two cells A and B are contiguous. A has OP = 10 atm, TP = 7 atm and DPD = 3 atm. B has OP = 8 atm, TP = 3 atm, DPD = 5 atm. The result would be:

- (a) No movement of water
- (b) Equilibrium between the two
- (c) Movement of water from A to B
- (d) Movement of water from B to A

Q. 131. In plant breeding programs, the entire collection of plants/seeds having all the diverse alleles for all genes in a given crops is called:

- (a) Selection of superior recombinants.
- (b) Cross-hybridization among the selected parents.
- (c) Evaluation and selection of parents.
- (d) Germplasm collection.

Q. 132. Which one is incorrect match?

- (a) Joint Forest Management – Started in 1980, in India.
- (b) Good ozone – Troposphere.
- (c) Snow-blindness – UV-B.
- (d) Montreal Protocol – Signed in Canada (1987).

Q. 133. In which of the following all three are macronutrients?

- (a) Boron, Zinc, Manganese
- (b) Iron, Copper, Molybdenum
- (c) Molybdenum, Magnesium, Manganese
- (d) Nitrogen, Nickel, Phosphorus

Q. 134. Offsets are produced by:

- (a) Parthenocarpy
- (b) Mitotic divisions
- (c) Meiotic divisions
- (d) Parthenogenesis

Q. 135. Match the following columns and select the correct option regarding connecting links.

Column I (Connecting links)	Column II (Between the groups)
A. Club moss	(i) Pteridophytes and Gymnosperms
B. Cycas	(ii) Gymnosperms and Angiosperms
C. Gnetum	(iii) Bryophytes and Pteridophytes
D. Hornworts	(iv) Protista and Bryophytes

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

ZOOLOGY

- Q. 136.** Which of the following is not a pyrimidine ?
(a) Cytosine (b) Uracil
(c) Guanine (d) Thymine
- Q. 137.** Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (mostly in nucleus)?
(a) Insulin, glucagon
(b) Thyroxine, insulin
(c) Somatostatin, oxytocin
(d) Cortisol, testosterone
- Q. 138.** Maximum number of existing transgenic animals is of:
(a) Pig (b) Fish
(c) Mice (d) Cow
- Q. 139.** Which is the most common mechanism of genetic variation in the population of sexually reproducing organism ?
(a) Transduction
(b) Chromosomal aberrations
(b) Genetic drift
(d) Recombination
- Q. 140.** The posterior pituitary gland is not a true endocrine gland because:
(a) It is provided with a duct.
(b) It only stores and releases hormones.
(c) It is under the regulation of hypothalamus.
(d) It secretes enzymes.
- Q. 141.** Nearly all of the essential nutrients, and 70-80% of electrolytes and water are reabsorbed by:
(a) Collecting duct (b) DCT
(c) Henle's loop (d) PCT
- Q. 142.** Which one of the following statements is correct regarding blood pressure?
(a) 130/90 mmHg is considered high and required treatment.
(b) 100/55 mmHg is considered an ideal blood pressure.
(c) 105/50 mmHg makes one very active.
(d) 190/110 mmHg may harm vital organs like brain and kidney.
- Q. 143.** A chemical signal that has both endocrine and neural roles is:
(a) Melatonin (b) Calcitonin
(c) Epinephrine (d) Cortisol
- Q. 144.** What is common between parrot, platypus and Kangaroo?
(a) Ovoparity
(b) Homeothermy
(c) Toothless jaws
(d) Functional post-anal tail
- Q. 145.** Elbow joint is an example of:
(a) Ball and socket joint
(b) Pivot joint
(c) Hinge joint
(d) Gliding joint
- Q. 146.** Intervertebral disc consists of a shock absorber skeletal connective tissue known as:
(a) Hyaline cartilage
(b) Elastic cartilage
(c) Fibro cartilage
(d) Calcified cartilage
- Q. 147.** At which stage of HIV infection does usually show symptoms of AIDS?
(a) When the infecting retrovirus enters host cells.
(b) When viral DNA is produced by reverse transcriptase.
(c) When HIV replicates rapidly in helper T-lymphocytes and damages large number of these.
(d) Within 15 days of sexual contact with an infected person.
- Q. 148.** Vomiting is an emetic reflex which is regulated by:
(a) Hypothalamus
(b) Superior colliculi of midbrain
(c) Medulla oblongata
(d) Pons
- Q. 149.** Parturition is induced by a complex neuroendocrine mechanism involving:
(a) Cortisol, ADH, progesterone.
(b) Cortisol, estrogens and oxytocin.
(c) FSH, LH and estrogen.
(d) Prolactin, oxytocin and cortisol.

Q. 150. Which of the following can enhance breathing rate ?

- (a) High pO_2 , low pH of blood.
- (b) High pCO_2 , and high pH of blood.
- (c) High pCO_2 , and low pH of blood.
- (d) High H^+ and high pH of blood.

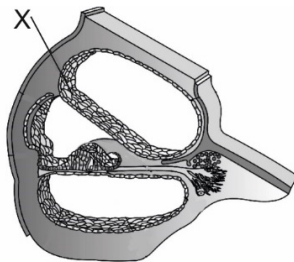
Q. 151. Tendons attach----A---- and is an example of ----B----connective tissue. Choose the option that fill the blanks A & B correctly.

	A	B
(a)	Muscles to bone	Dense regular
(b)	Bone to bone	Dense regular
(c)	Muscles to bone	Dense irregular
(d)	Muscle to muscle	Dense regular

Q. 152. Choose the incorrect statement.

- (a) Basophils secrete histamine, serotonin, heparin and are involved in inflammatory reactions.
- (b) Eosinophils resist infections and are associated with allergic reactions.
- (c) Megakaryocytes are cell fragments responsible for immune responses of the body.
- (d) Neutrophils and monocytes are phagocytic in nature.

Q. 153. Identify the structure marked as 'X' in the figure given below:



- (a) Basilar membrane
- (b) Tectorial membrane
- (c) Tympanic membrane
- (d) Reissner's membrane

Q. 154. Oral contraceptives do not work by:

- (a) Inhibition of ovulation.
- (b) Changing the consistency of cervical mucus.
- (c) Antagonistic action on gonadotropins.
- (d) Spermicidal action.

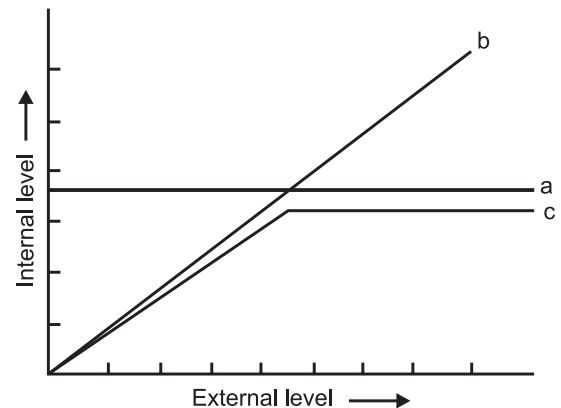
Q. 155. Heterogametes are produced by:

- (a) Human female
- (b) Female grasshopper
- (c) Female *Drosophila*
- (d) Female bird

Q. 156. Menstrual flow occurs due to lack of :

- (a) Oxytocin (b) Vasopressin
- (c) Progesterone (d) FSH

Q. 157. This is a diagrammatic representation of response of organisms to biotic. What do *a*, *b*, *c* represent respectively.



- (a) Partial regulator, conformer.
- (b) Regulator, conformer, partial regulator.
- (c) Conformer, regulator, partial regulator.
- (d) Regulator, partial conformer, regulator.

Q. 158. Myasthenia gravis is muscular disorder in which muscle becomes weak and paralysed. It is due to:

- (a) Spasm in muscle due to hypocalcemia in blood plasma.
- (b) Non-formation of dystrophin protein which is essential for connection between sarcolemma and actin filament.
- (c) Degeneration of acetylcholine receptor on sarcolemma as it attacked by own antibodies.
- (d) Resorption / dissolution of bone matrix.

Q. 159. Which one of the following kinds of animals are triploblastic ?

- (a) Corals (b) Flatworms
- (c) Sponges (d) Ctenophores

Q. 160. In humans, blood passes from the post-caval to the diastolic right atrium of heart due to :

- (a) Pressure difference between the post-caval and atrium.
- (b) Pushing open of the venous valves.
- (c) Suction pull.
- (d) Stimulation of the sino-atrial node.

Q. 161. Emphysema is a chronic disorder, it leads to:

- (a) Loss of elasticity of walls of bronchioles and alveoli.
- (b) Surface area of exchange of gases is increased.
- (c) Alveolar sacs become empty even after expiration.
- (d) Exhalation becomes easier during inflation of Lungs.

Q. 162. Coca alkaloid obtained from *Erythroxylum* sp.

- (a) Acts as an analgesic.
- (b) Interferes with the transport of dopamine.
- (c) Is taken by oral ingestion.
- (d) Acts as depressant to slow down body functions.

Q. 163. Pseudounipolar neuron is found in:

- (a) Organ of Corti.
- (b) Cerebral cortex.
- (c) Dorsal root ganglia of spinal cord.
- (d) Both dorsal root and ventral root ganglia of spinal cord.

Q. 164. Match the items of column I with column II and select the correct option:

Column I	Column II
(A) XX-XO method of sex determination	(i) Turners' syndrome
(B) XX-XY method of sex determination	(ii) Female heterogametic
(C) 45 chromosomes	(iii) Grasshopper
(D) ZW-ZZ method of sex determination	(iv) Female homogametic

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

Q. 165. Compared to blood our lymph has:

- (a) More RBCs and less WBCs
- (b) No plasma
- (c) Plasma without proteins
- (d) More WBCs and no RBCs

Q. 166. The first clinical gene therapy was given for treating:

- (a) Diabetes mellitus
- (b) Chicken pox
- (c) Rheumatoid arthritis
- (d) Adenosine deaminase deficiency

Q. 167. Choose the incorrect match regarding *Plasmodium* and type of malaria caused by it:

(a)	<i>Plasmodium falciparum</i>	Cerebral malaria
(b)	<i>Plasmodium ovale</i>	Mild tertian malaria
(c)	<i>Plasmodium malariae</i>	Quartan malaria
(d)	<i>Plasmodium vivax</i>	Malignant tertian malaria

Q. 168. Which of the following arrives earliest at the site of infection?

- (a) Monocyte
- (b) Eosinophil
- (c) Basophil
- (d) Neutrophil

Q. 169. Read the statements (1 to 4):

- (1) Pectoral girdle consists of scapula and clavicle.
- (2) Patella covers the knee ventrally.
- (3) In human, six ribs are vertebrochondral.
- (4) Human ribs are bicephalic.

How many of the above statements are incorrect?

- (a) 1
- (b) 3
- (c) 2
- (d) 0

Q. 170. Select the incorrect match:

- (a) Submetacentric - L-shaped Chromosomes
- (b) Allosomes - Sex chromosomes
- (c) Lampbrush Chromosomes - Diplotene bivalents
- (d) Polytene Chromosomes - Oocytes of amphibians

Q. 171. Outbreeding is an important strategy of animal husbandry because it:

- (a) Helps in accumulation of superior genes.
- (b) Is useful in producing purelines of animals.
- (c) Is useful in overcoming inbreeding depression.
- (d) Exposes harmful recessive genes that are eliminated by selection.

Q. 172. Which gas was probably absent in free form in early atmosphere?

- (a) CH_4 (b) O_2
(c) NH_3 (d) CO_2

Q. 173. Match Column-I with Column-II and select the correct option.

Column I	Column II
(A) Carbon monoxide	(i) Stone cancer
(B) Sulphur dioxide	(ii) Carboxy haemoglobin
(C) Hydrocarbons	(iii) Minamata disease
(D) Mercury	(iv) Cancer

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

Q. 174. In the stomach, gastric acid is secreted by the:

- (a) Parietal cells
(b) Peptic cells
(c) Acidic cells
(d) Gastrin secreting cells

Q. 175. Which of the following mixture were taken by Miller in 1953 during simulation experiment to test Oparin and Haldane theory?

- (a) CH_4 , H_2 , NH_3 (2 : 1 : 2) and water mixture.
(b) CH_4 , NH_3 , H_2 (1 : 2 : 1) and H_2O vapour.
(c) CH_4 , NH_3 , H_2 (2 : 1 : 2) and water vapour.
(d) NH_3 , CH_4 , H_2 (2 : 1 : 2) and water vapour.

Q. 176. Release of polar body from human egg occurs:

- (a) After formation of zygote.
(b) Before the sperm entry.
(c) After the fertilisation.
(d) After the entry of sperm.

Q. 177. What are protamines?

- (a) Large size DNA.
(b) Sequences that are unique.
(c) Histone like protein found in fish sperm.
(d) Highly repetitive DNA.

Q. 178. Match the following options according to the correct categorisation of animals with the type of faeces they excrete out.

Column I	Column II
A. Earthworms	1. Spraint
B. Caterpillars	2. Guano
C. Seabirds	3. Vermicast
D. Otters	4. Frass

Codes

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

Q. 179. Variation in gene frequencies within population can occur by chance rather than by natural selection. This is referred to as :

- (a) Genetic flow
(b) Genetic drift
(c) Random mating
(d) Genetic load

Q. 180. Which one of the following pairs is mismatched?

- (a) Sickle - Cell Anaemia – Chromosome 11
(b) Alpha Thalassemia – Chromosome 11
(c) Cystic Fibrosis – Chromosome 7
(d) Phenylketonuria – Chromosome 12