

NEET 2026 SAMPLE PAPER 6

- A) **Total Duration:** 3-hour and 20-minute (200 minutes)
B) **Pattern:** 180 Multiple Choice Questions (MCQs) out of a total of 200
C) **Marking Scheme & Rules:**
- Correct Answer: +4 marks
 - Incorrect Answer: -1 mark (Negative marking)
 - Unattempted Question: 0 marks
 - Multiple Answers: Treated as incorrect, attracting -1 mark

Physics (Section A)

Q1. A 2 amp current is flowing through two different small circular copper coils having radii ratio 1 : 2. The ratio of their respective magnetic moments will be:

- (A) 1:2
(B) 2:1
(C) 4:1
(D) 1:4

Q2. The kinetic energies of two similar cars A and B are 100 J and 225 J respectively. On applying brakes, car A stops after 1000 m and car B stops after 1500 m. If F_A and F_B are the forces applied by the brakes on cars A and B, respectively, then the ratio F_A/F_B is:

- (A) 2/3
(B) 1/3
(C) 1/2
(D) 3/2

Q3. A uniform rod of mass 20 kg and length 5 m leans against a smooth vertical wall making an angle of 60° with it. The other end rests on a rough horizontal floor. The friction force that the floor exerts on the rod is (take $g = 10 \text{ m/s}^2$):

- (A) 200 N
(B) $200\sqrt{3}N$
(B) 100 N
(C) $100\sqrt{3}N$

Q4. De-Broglie wavelength of an electron orbiting in the $n = 2$ state of hydrogen atom is close to (Given Bohr radius = 0.052 nm):

- (A) 0.67 nm
(B) 1.67 nm

- (C) 2.67 nm
- (D) 0.067 nm

Q5. A body weighs 48 N on the surface of the earth. The gravitational force experienced by the body due to the earth at a height equal to one-third the radius of the earth from its surface is:

- (A) 27 N
- (B) 32 N
- (C) 36 N
- (D) 16 N

Q6. Two cities X and Y are connected by a regular bus service with a bus leaving in either direction every T min. A girl driving a scooty at 60 km/h in the direction X to Y notices that a bus goes past her every 30 minutes in the direction of her motion, and every 10 minutes in the opposite direction. Choose the correct option for T and the speed of the buses:

- (A) 25 min, 100 km/h
- (B) 10 min, 90 km/h
- (C) 15 min, 120 km/h
- (D) 9 min, 40 km/h

Q7. AB is a part of an electrical circuit. The potential difference $V_A - V_B$, at the instant when current $i = 2$ A and is increasing at a rate of 1 A/s is (assuming a circuit with 1 H inductor, 5 V battery, and 2Ω resistor):

- (A) 6 volt
- (B) 9 volt
- (C) 10 volt
- (D) 5 volt

Q8. An oxygen cylinder of volume 30 litre has 18.20 moles of oxygen. After some oxygen is withdrawn, its gauge pressure drops to 11 atm at 27°C . The mass of oxygen withdrawn is nearly: (Given $R = 100/12$ J mol $^{-1}$ K $^{-1}$, $M_{\text{O}_2} = 32$, 1 atm = 1.01×10^5 N/m 2)

- (A) 0.144 kg
- (B) 0.116 kg
- (C) 0.156 kg
- (D) 0.125 kg

Q9. A photon and an electron (mass m) have the same energy E . The ratio $\lambda_{\text{photon}}/\lambda_{\text{electron}}$ of their de Broglie wavelengths is (c is speed of light):

- (A) $c\sqrt{2mE}$
- (B) $c\sqrt{2m/E}$
- (C) $\sqrt{E/2m}$

(D) $c\sqrt{2mE}$

Q10. A constant voltage of 50 V is maintained between points A and B of the circuit shown. The current through the branch CD of the circuit is:

- (A) 2.0 A
- (B) 2.5 A
- (C) 3.0 A
- (D) 1.5 A

Q11. A parallel plate capacitor made of circular plates is being charged such that the surface charge density increases at a constant rate. The magnetic field arising due to displacement current is:

- (A) constant between the plates and zero outside
- (B) non-zero everywhere with maximum at the periphery
- (C) zero between the plates and non-zero outside
- (D) zero at all places

Q12. In a Vernier callipers, 10 V.S.D. = 9 M.S.D. The least division in M.S. is 0.1 cm and the zero of V.S. is at $x = 0.1$ cm when jaws are closed. If M.S. reading is 5 cm and the 8th V.S. division coincides, the corrected diameter is:

- (A) 5.08 cm
- (B) 4.98 cm
- (C) 5.00 cm
- (D) 5.18 cm

Q13. Two identical charged spheres A and B have charge q and force F . A third identical uncharged sphere is touched to A, then to B, then removed. The new force of repulsion between A and B is:

- (A) $2F/3$
- (B) $F/2$
- (C) $3F/8$
- (D) $3F/5$

Q14. Capacitor plates are separated by d . Two slabs of dielectric constant K_1 and K_2 with thickness $3d/8$ and $d/2$ are inserted. Due to this, capacitance doubles. If $K_1 = 1.25K_2$, the value of K_1 is:

- (A) 2.33
- (B) 1.60
- (C) 1.33
- (D) 2.66

Q15. An electric dipole with moment 5×10^{-6} Cm is aligned with a uniform field of 4×10^5 N/C. The dipole is then rotated through an angle of 60° . The change in potential energy is:

- (A) 1.0 J
- (B) 1.2 J
- (C) 1.5 J
- (D) 0.8 J

Q16. The radius of Martian orbit around the Sun is about 4 times the radius of Mercury's orbit. If a Martian year is 687 Earth days, the length of 1 year on Mercury is:

- (A) 225 earth days
- (B) 172 earth days
- (C) 124 earth days
- (D) 88 earth days

Q17. A wire of resistance R is cut into 8 equal pieces. From these, two sets are made by connecting 4 pieces in parallel. These two sets are then connected in series. The net effective resistance is:

- (A) $R/32$
- (B) $R/16$
- (C) $R/8$
- (D) $R/64$

Q18. The intensity of transmitted light when a polaroid sheet is placed between two crossed polaroids at 22.5° from the polarization axis of the first is (I_0 is intensity after first polaroid):

- (A) $I_0/4$
- (B) $I_0/8$
- (C) $I_0/16$
- (D) $I_0/2$

Q19. In a camera, four similar thin convex lenses are arranged axially in contact. The power of the combination and the total magnification compared to p and m of each lens will be:

- (A) $4p$ and m^4
- (B) p^4 and m^4
- (C) $4p$ and $4m$
- (D) p^4 and $4m$

Q20. The Sun rotates once in 27 days. What will be the period of revolution if the Sun were to expand to twice its present radius without external influence (assume uniform density)?

- (A) 105 days
- (B) 115 days
- (C) 108 days
- (D) 100 days

Q21. A microscope has an objective of $f = 2$ cm, eyepiece of $f = 4$ cm and tube length 40 cm. If the distance of distinct vision is 25 cm, the magnification is:

- (A) 125
- (B) 150
- (C) 250
- (D) 100

Q22. An unpolarized light beam in air is incident on a medium ($\mu = 1.73$) at Brewster's angle. Then:

- (A) reflected light is polarized and reflection angle is 30°
- (B) both are polarized; reflection 60° and refraction 30°
- (C) transmitted light is polarized and refraction angle is 30°
- (D) reflected light is polarized and reflection angle is 60°

Q23. In a full wave rectifier with $V_{in} = 220 \sin(100\pi t)$ volt, at $t = 15$ msec:

- (A) D_1 is reverse biased, D_2 is forward biased
- (B) D_1 and D_2 both are forward biased
- (C) D_1 and D_2 both are reverse biased
- (D) D_1 is forward biased, D_2 is reverse biased

Q24. The electric field in an EM wave is $E_z = 60 \cos(5x + 1.5 \times 10^9 t)$ V/m. The expression for the corresponding magnetic field is:

- (A) $B_x = 2 \times 10^{-7} \cos(5x + 1.5 \times 10^9 t)$ T
- (B) $B_z = 60 \cos(5x + 1.5 \times 10^9 t)$ T
- (C) $B_y = 60 \sin(5x + 1.5 \times 10^9 t)$ T
- (D) $B_y = 2 \times 10^{-7} \cos(5x + 1.5 \times 10^9 t)$ T

Q25. A model states flux through an electron orbit is $n(h/e)$. According to this model, the magnetic moment of an electron in its lowest energy state will be:

- (A) $he/(2\pi m)$
- (B) $heB/(\pi m)$
- (C) $heB/(2\pi m)$
- (D) $he/(\pi m)$

Q26. An electron ($m = 9 \times 10^{-31}$ kg) moving at $c/100$ enters a magnetic field $B = 9 \times 10^{-4}$ T. To prevent deflection, the required electric field E must be:

- (A) $E \perp B$ with magnitude 27×10^2 V/m
- (B) $E \parallel B$ with magnitude 27×10^2 V/m
- (C) $E \parallel B$ with magnitude 27×10^4 V/m
- (D) $E \perp B$ with magnitude 27×10^4 V/m

Q27. A bob of mass m is given horizontal velocity v_0 . If the string gets slack at point P making angle θ from the horizontal, the ratio of speed v at P to v_0 is:

- (A) $(1/(2 + 3 \sin \theta))^{1/2}$
- (B) $(\cos \theta/(2 + 3 \sin \theta))^{1/2}$
- (C) $(\sin \theta/(2 + 3 \sin \theta))^{1/2}$
- (D) $(\sin \theta)^{1/2}$

Q28. A pipe open at both ends has fundamental frequency f . If dipped vertically in water to half its length, the fundamental frequency of the air column becomes:

- (A) f
- (B) $3f/2$
- (C) $2f$
- (D) $f/2$

Q29. A balloon has surface tension S , outlet area A , gas density ρ , and radius R . If $T \propto S^a A^b \rho^\gamma R^\delta$, find the correct exponents:

- (A) $a = -1/2, \beta = -1, \gamma = -1/2, \delta = 7/2$
- (B) $a = -1/2, \beta = -1, \gamma = 1/2, \delta = 7/2$
- (C) $a = 1/2, \beta = -1, \gamma = 1/2, \delta = 7/2$
- (D) $a = 1/2, \beta = -1, \gamma = -1, \delta = 3/2$

Q30. Three rods ($2K, K, 2K$) are connected in series between $3T$ and T . In steady state, the temperatures at the left and right junctions are T_1 and T_2 . The ratio T_1/T_2 is:

- (A) $4/3$
- (B) $5/3$
- (C) $5/4$
- (D) $3/2$

Q31. A quantity $P = a^3 b^2 / (c \sqrt{d})$ has measurement errors in a, b, c, d of 1%, 3%, 2%, and 4%. The percentage error in P is:

- (A) 2%
- (B) 13%
- (C) 15%
- (D) 10%

Q32. The relation between time (t) and position (x) is $t = x^2 + x$. The acceleration of the particle is:

- (A) $-2/(2x + 1)^3$
- (B) $+2/(x + 1)^3$
- (C) $+2/(2x + 1)$
- (D) $-2/(x + 2)^3$

Q33. Two gases A and B at same pressure have pistons of radii r_A and r_B . Under equal heat, pistons displace 16 cm and 9 cm. If ΔU is same, the ratio r_A/r_B is:

- (A) $3/4$
- (B) $2/\sqrt{3}$
- (C) $\sqrt{3}/2$
- (D) $4/3$

Q34. In a spring-mass system, sand leaks out slowly. Which option correctly depicts the changes in frequency $\omega(t)$ and amplitude $A(t)$ with time?

- (A) frequency increases, amplitude decreases
- (B) frequency decreases, amplitude increases
- (C) frequency remains constant, amplitude increases
- (D) frequency increases, amplitude remains constant

Q35. A sphere of radius R is cut from a solid sphere of radius $2R$. The ratio of the moment of inertia of the smaller sphere to the rest part about the Y-axis is:

- (A) $7/40$
- (B) $7/57$
- (C) $7/64$
- (D) $7/8$

Physics (Section B)

Q36. There are two inclined surfaces of equal length L and same angle of inclination 45° with the horizontal. One is rough and the other is perfectly smooth. A body takes 2 times as much time to slide down the rough surface than the smooth surface. The coefficient of kinetic friction μ_k is:

- (A) 0.5
- (B) 0.75
- (C) 0.25
- (D) 0.40

Q37. A container has two chambers of volumes $V_1 = 2$ litres and $V_2 = 3$ litres separated by a thermal insulator. The chambers contain $n_1 = 5$ and $n_2 = 4$ moles of ideal gas at $p_1 = 1$ atm and $p_2 = 2$ atm, respectively. When the partition is removed, the equilibrium pressure is:

- (A) 1.6 atm
- (B) 1.8 atm
- (C) 1.3 atm
- (D) 1.4 atm

Q38. A water tank has one wall at $x = L$. When filled with a liquid of surface tension S and density ρ , the surface makes an angle θ_0 ($\theta_0 \ll 1$) with the x-axis at $x = L$. If $y(x)$ is the height of the surface, the governing equation is:

- (A) $\frac{d^2y}{dx^2} = \frac{\rho g}{S} y$
- (B) $\frac{dy}{dx} = \sqrt{\frac{\rho g}{S}} x$
- (C) $\frac{d^2y}{dx^2} = \sqrt{\frac{\rho g}{S}}$
- (D) $\frac{d^2y}{dx^2} = \frac{\rho g}{S} y$

Q39. An electron ($m = 9 \times 10^{-31}$ kg, $q = 1.6 \times 10^{-19}$ C) moving with speed $c/100$ is injected into a magnetic field $B = 9 \times 10^{-4}$ T perpendicular to its motion. To prevent deflection, the required uniform electric field E must be:

- (A) $E \parallel B$ and 27×10^2 V/m
- (B) $E \perp B$ and 27×10^4 V/m
- (C) $E \parallel B$ and 27×10^4 V/m
- (D) $E \perp B$ and 27×10^2 V/m

Q40. The output (Y) of the given logic implementation is similar to the output of which logic gate?

- (A) OR
- (B) NOR
- (C) AND
- (D) NAND

Q41. A 2 amp current flows through two different small circular copper coils having a radii ratio of 1 : 2. The ratio of their respective magnetic moments will be:

- (A) 1:2
- (B) 2:1
- (C) 4:1
- (D) 1:4

Q42. Determine the current passing through the battery in the given circuit configuration:

- (A) 0.5 A
- (B) 2.5 A
- (C) 1.5 A
- (D) 2.0 A

Q43. A particle of mass m moves around the origin with a constant force F pulling it towards the center. Using the Bohr model, the radius r of the n^{th} orbit and the speed v depend on n as:

- (A) $r \propto n^{1/3}; v \propto n^{2/3}$
- (B) $r \propto n^{2/3}; v \propto n^{1/3}$
- (C) $r \propto n^{4/3}; v \propto n^{-1/3}$
- (D) $r \propto n^{1/3}; v \propto n^{1/3}$

Q44. Two identical point masses P and Q, suspended from springs with constants k_1 and k_2 , oscillate vertically. If their maximum speeds are identical, the ratio of their amplitudes A_Q/A_P is:

- (A) k_1/k_2
- (A) $\sqrt{k_2/k_1}$
- (B) $\sqrt{k_1/k_2}$
- (C) k_2/k_1

Q45. A ball of mass 0.5 kg is dropped from a height of 40 m. It hits the ground and rises back to a height of 10 m. The impulse imparted to the ball during the collision is ($g = 9.8 \text{ m/s}^2$):

- (A) 7 NS
- (B) 0
- (C) 84 NS
- (D) 21 NS

Q46. An iron bar of length L has magnetic moment M . It is bent at its midpoint such that the two arms make an angle of 60° with each other. The new magnetic moment is:

- (A) M
- (B) $M/2$
- (C) $2M$
- (D) $M/\sqrt{3}$

Q47. A metallic bar ($Y = 0.5 \times 10^{11} \text{ N/m}^2, \alpha = 10^{-5} \text{ }^\circ\text{C}^{-1}, L = 1 \text{ m}, A = 10^{-3} \text{ m}^2$) is heated from 0°C to 100°C without expansion. The compressive force developed is:

- (A) $5 \times 10^3 \text{ N}$
- (B) $50 \times 10^3 \text{ N}$
- (C) $100 \times 10^3 \text{ N}$
- (D) $2 \times 10^3 \text{ N}$

Q48. If the plates of a parallel plate capacitor connected to a battery are moved closer to each other, which of the following is true? (A: Charge increases, B: Energy decreases, C: Capacitance increases, E: Product of charge and voltage increases)

- (A) A, B and E only

- (B) A, C and E only
- (C) B, D and E only
- (D) A, B and C only

Q49. A small telescope has an objective of focal length 140 cm and an eyepiece of focal length 5.0 cm. The magnifying power of the telescope for viewing a distant object is:

- (A) 34
- (B) 28
- (C) 17
- (D) 32

Q50. A sheet is placed on a horizontal surface in front of a strong magnetic pole. A force is required to move the sheet away with uniform velocity if it is:

- (A) Hold if magnetic
- (B) Hold if non-magnetic
- (C) Move if conducting
- (D) Move if non-conducting and non-polar

Chemistry (Section A)

Q51. Out of the following complex compounds, which will exhibit the minimum conductance in solution?

- (A) $[Co(NH_3)_6]Cl_3$
- (B) $[Co(NH_3)_5Cl]Cl_2$
- (C) $[Co(NH_3)_3Cl_3]$
- (D) $[Co(NH_3)_4Cl_2]Cl$

Q52. Which of the following aqueous solutions will exhibit the highest boiling point?

- (A) 0.01 M Na_2SO_4
- (B) 0.015 M Glucose
- (C) 0.01 M Urea
- (D) 0.01 M KNO_3

Q53. Assertion (A): I^- undergoes S_N2 reaction faster than Cl^- . Reason (R): Iodine is a better leaving group because of its large size.

- (A) A is true but R is false
- (B) A is false but R is true
- (C) Both A and R are true and R is the correct explanation
- (D) Both A and R are true but R is not the correct explanation

Q54. Consider KO_2 , H_2O_2 , and H_2SO_4 . The oxidation states of the underlined elements (K in KO_2 , O in H_2O_2 , and S in H_2SO_4) are, respectively:

- (A) +1, -2, +4
- (B) +4, -4, +6
- (C) +1, -1, +6
- (D) +2, -2, +6

Q55. Match the processes to their catalysts: A. Haber (I. Fe), B. Wacker (II. $PdCl_2$), C. Wilkinson (III. $[(PPh_3)_3RhCl]$), D. Ziegler (IV. $TiCl_4$ with $Al(CH_3)_3$)

- (A) A-I, B-II, C-III, D-IV
- (B) A-I, B-IV, C-III, D-II
- (C) A-I, B-II, C-IV, D-III
- (D) A-II, B-III, C-I, D-IV

Q56. Statement I: Like nitrogen can form ammonia, arsenic can form arsine. Statement II: Antimony cannot form antimony pentoxide.

- (A) Statement I is correct, Statement II is incorrect
- (B) Statement I is incorrect, Statement II is correct
- (C) Both are correct
- (D) Both are incorrect

Q57. Statement I: Ferromagnetism is an extreme form of paramagnetism. Statement II: The number of unpaired electrons in Cr^{2+} ($Z = 24$) is the same as in Nd^{3+} ($Z = 60$).

- (A) Statement I is true, Statement II is false
- (B) Statement I is false, Statement II is true
- (C) Both are true
- (D) Both are false

Q58. Which one of the following reactions does NOT yield benzene as the product?

- (A) Acetylene in red hot Iron Tube at 873 K
- (B) Benzene diazonium chloride in warm H_2O
- (C) Benzoyl chloride with sodalime and heat
- (D) n-hexane with Mo_2O_3 at 773 K

Q59. Match the molecules to their hybridization/geometry: A. XeO_3 (Pyramidal), B. XeF_2 (Linear), C. $XeOF_4$ (Square Pyramidal), D. XeF_6 (Distorted Octahedral)

- (A) A-IV, B-II, C-III, D-I
- (B) A-IV, B-II, C-I, D-III
- (C) A-II, B-I, C-IV, D-III
- (D) A-II, B-I, C-III, D-IV

Q60. How many products (including stereoisomers) are expected from the monochlorination of 2-methylbutane?

- (A) 5
- (B) 6
- (C) 2
- (D) 4

Q61. Which of the following are true? A. Ga has high MP, Cs has low MP. C. Ar , K^+ , Cl^- , Ca^{2+} , and S^{2-} are isoelectronic. E. Atomic radius of Cs > Li and Rb.

- (A) C and D only
- (B) A, C, and E only
- (C) A, B, and E only
- (D) C and E only

Q62. The standard heat of formation (kcal/mol) of $Ba_{(aq)}^{2+}$ is: (Given: $\Delta H_f SO_4^{2-} = -216$, $\Delta H_{cryst} BaSO_4 = -4.5$, $\Delta H_f BaSO_4(s) = -349$)

- (A) +133.0
- (B) +220.5
- (C) -128.5
- (D) -133.0

Q63. Match the mixture to the solution type: A. Humidity (Liq in Gas), B. Alloys (Sol in Sol), C. Amalgams (Liq in Sol), D. Smoke (Sol in Gas)

- (A) A-III, B-I, C-IV, D-II
- (B) A-III, B-II, C-I, D-IV
- (C) A-II, B-IV, C-I, D-III
- (D) A-II, B-I, C-IV, D-III

Q64. For $C(s) + 2H_2(g) \rightarrow CH_4(g)$ with $\Delta H = -74.8$ kJ/mol, the energy profile shows:

- (A) Exothermic: Products lower than reactants
- (B) Endothermic: Products higher than reactants
- (C) Zero activation energy
- (D) Non-spontaneous reaction

Q65. Sugar 'X' is found in honey, is a keto sugar, has α/β anomers, and is laevorotatory. 'X' is:

- (A) Maltose
- (B) Sucrose
- (C) D-Glucose
- (D) D-Fructose

Q66. Total number of possible isomers (structural and stereoisomers) of cyclic ethers with formula C_4H_8O is:

- (A) 10
- (B) 11
- (C) 6
- (D) 8

Q67. For $A(g) \rightleftharpoons 2B(g)$, $k_{backward} = 2500 \times k_{forward}$ at 1000 K. Find K_p .

- (A) 2.077×10^5
- (B) 0.033
- (C) 0.021
- (D) 83.1

Q68. Find the wavelength ratio of light absorbed for $n = 2 \rightarrow 3$ and $n = 4 \rightarrow 6$ transitions in Hydrogen.

- (A) 1/16
- (B) 1/9
- (C) 1/4
- (D) 1/36

Q69. If molar conductivity of a 0.050 M weak acid is $90 \text{ S cm}^2/\text{mol}$, find degree of dissociation ($\lambda_+^\circ = 349.6$, $\lambda_-^\circ = 50.4$).

- (A) 0.225
- (B) 0.215
- (C) 0.115
- (D) 0.125

Q70. X (5 mol) and Y (10 mol) give a solution with $P = 70$ torr. $P_X^\circ = 63$, $P_Y^\circ = 78$. The solution shows:

- (A) Ideal behavior
- (B) Positive deviation
- (C) Negative deviation
- (D) Zero volume change

Q71. Sets with equal number of atoms: A. 212g Na_2CO_3 , B. 248g Na_2O , C. 240g NaOH, D. 12g H_2 , E. 220g CO_2 .

- (A) A, B, and D only
- (B) B, C, and D only
- (C) B, D, and E only
- (D) A, B, and C only

Q72. Which are paramagnetic? A. $[NiCl_4]^{2-}$, B. $Ni(CO)_4$, C. $[Ni(CN)_4]^{2-}$, D. $[Ni(H_2O)_6]^{2+}$, E. $Ni(PPh_3)_4$.

- (A) A and D only
- (B) A, D and E only
- (C) A and C only
- (D) B and E only

Q73. If $t_{1/2}$ for a first order reaction is 1 minute, the time for 99.9% completion is:

- (A) 5 minutes
- (B) 10 minutes
- (C) 2 minutes
- (D) 4 minutes

Q74. Calculate energy and radius of first Bohr orbit for Li^{2+} and He^+ ($a_0 = 52.9$ pm, $R_H = 2.18 \times 10^{-18}$ J):

- (A) Li^{2+} : -19.62×10^{-16} J, 17.6 pm; He^+ : -8.72×10^{-16} J, 26.4 pm
- (B) Li^{2+} : -19.62×10^{-16} J, 17.6 pm; He^+ : -8.72×10^{-16} J, 26.4 pm
- (C) Li^{2+} : -8.72×10^{-16} J, 17.6 pm; He^+ : -19.62×10^{-16} J, 26.4 pm
- (D) Li^{2+} : -8.72×10^{-18} J, 17.6 pm; He^+ : -19.62×10^{-18} J, 26.4 pm

Q75. What is the correct order of bond dissociation energy for the marked C–H bonds in the given structures?

- (A) III > II > I
- (B) II > III > I
- (C) II > I > III
- (D) I > II > III

Q76. Dalton's Atomic theory failed to explain:

- (A) Multiple proportion
- (B) Gaseous volume
- (C) Conservation of mass
- (D) Constant proportion

Q77. Identify correct orders: A. $H_2O > NH_3 > CHCl_3$ (Dipole), D. $N_2 > O_2 > H_2$ (Bond enthalpy).

- (A) A, C only
- (B) B, C only
- (C) A, D only
- (D) B, D only

Q78. Match Vitamin to deficiency: A. B_{12} (IV. Pernicious anaemia), B. D (III. Rickets), C. B_2 (I. Cheilosis), D. B_6 (II. Convulsions)

- (A) A-II, B-III, C-I, D-II
- (B) A-IV, B-III, C-II, D-I
- (C) A-I, B-III, C-II, D-IV
- (D) A-IV, B-III, C-I, D-II

Q79. The correct order of decreasing basic strength of the given amines is:

- (A) N-ethylethanamine > ethanamine > benzenamine > N-methylaniline
- (B) benzenamine > ethanamine > N-methylaniline > N-ethylethanamine
- (C) N-methylaniline > benzenamine > ethanamine > N-ethylethanamine
- (D) N-ethylethanamine > ethanamine > N-methylaniline > benzenamine

Q80. Wavelength of light absorbed: A. $[Co(NH_3)_6]^{3+}$, B. $[Co(CN)_6]^{3-}$, C. $[Cu(H_2O)_4]^{2+}$, D. $[Ti(H_2O)_6]^{3+}$.

- (A) $C < D < A < B$
- (B) $C < A < D < B$
- (C) $B < A < D < C$
- (D) $B < D < A < C$

Q81. Which one of the following compounds does NOT decolourize bromine water?

- (A) Phenol
- (B) Styrene
- (C) Cyclohexene
- (D) Benzene

Q82. Major product 'P': 1-methylcyclopent-1-ene with (i) HBr/Peroxide, (ii) KCN, (iii) Na(Hg)/EtOH.

- (A) Cyclopentane with CH_3 and CH_2NH_2 on adjacent carbons
- (B) Cyclopentane with CH_3 and NC groups
- (C) Cyclopentane with NC and CH_3 on same carbon
- (D) Cyclopentane with CH_3 and CH_2NH_2 on same carbon

Q83. Match: A. $CHCl_3$ /Aniline (IV. Simple), B. Crude oil (III. Fractional), C. Glycerol (I. Reduced Pressure), D. Aniline/Water (II. Steam)

- (A) A-IV, B-III, C-II, D-I
- (B) A-III, B-IV, C-I, D-II
- (C) A-IV, B-III, C-I, D-II
- (D) A-IV, B-III, C-II, D-I

Q84. Main group configurations: A. $[Ne]3s^1$, C. $[Kr]4d^{10}5s^25p^5$.

- (A) D and E only
- (B) A, C and D only

- (C) B and E only
- (D) A and C only

Q85. Which one of the following compounds can exist as cis-trans isomers?

- (A) 1,1-Dimethylcyclopropane
- (B) 1,2-Dimethylcyclohexane
- (C) Pent-1-ene
- (D) 2-Methylhex-2-ene

Chemistry (Section B)

Q86. Phosphoric acid (H_3PO_4) ionizes in three steps with constants K_{a1} , K_{a2} , and K_{a3} , while K is the overall ionization constant. Which of the following statements are true? (A: $\log K = \log K_{a1} + \log K_{a2} + \log K_{a3}$, B: H_3PO_4 is a stronger acid than $H_2PO_4^-$ and HPO_4^{2-} , C: $K_{a1} > K_{a2} > K_{a3}$)

- (A) A and B only
- (B) A and C only
- (C) B, C and D only
- (D) A, B and C only

Q87. Match the ions in List I with their respective Group Number in cation analysis in List II: A. Co^{2+} (Group-IV), B. Mg^{2+} (Group-VI), C. Pb^{2+} (Group-I), D. Al^{3+} (Group-III)

- (A) A-III, B-IV, C-I, D-II
- (B) A-III, B-II, C-IV, D-I
- (C) A-III, B-II, C-I, D-IV
- (D) A-III, B-IV, C-II, D-I

Q88. In the reaction $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ with $\Delta H = +180.7 \text{ kJ mol}^{-1}$, a higher yield of NO can be obtained at: (A: higher temperature, C: higher concentration of N_2 , D: higher concentration of O_2)

- (A) B, C, D only
- (B) A, C, D only
- (C) A, D only
- (D) B, C only

Q89. Statement I: Benzenediazonium salt is prepared from aniline and nitrous acid at 273 – 278 K and decomposes easily when dry. Statement II: Insertion of iodine into benzene is difficult, so iodobenzene is prepared using benzenediazonium salt and KI.

- (A) Both are correct
- (B) Both are incorrect

- (C) Statement I is correct, Statement II is incorrect
 (D) Statement I is incorrect, Statement II is correct

Q90. What is the major product of the reaction of benzene-substituted $C(=O)CH_2CN$ with (i) excess CH_3MgBr and (ii) H_3O^+ ?

- (A) Compound with phenyl- $C(OH)(CH_3) - C(=O) - CH_3$ structure
 (B) Compound with phenyl- $C(OH) - C(=O) - CH_3$ and CH_3 groups
 (C) Compound with phenyl- $C(OH)(CH_3) - CN$ structure
 (D) Compound with phenyl- $C(OH)(CH_3)_2$ structure

Q91. During the preparation of Mohr's salt solution (Ferrous ammonium sulphate), which acid is added to prevent the hydrolysis of the Fe^{2+} ion?

- (A) dilute hydrochloric acid
 (B) concentrated sulphuric acid
 (C) dilute nitric acid
 (D) dilute sulphuric acid

Q92. In a sealed vessel, the equilibrium concentrations are $[N_2] = 3.0 \times 10^{-3}$ M, $[O_2] = 4.2 \times 10^{-3}$ M and $[NO] = 2.8 \times 10^{-3}$ M for $2NO(g) \rightleftharpoons N_2(g) + O_2(g)$. If 0.1 mol L^{-1} of NO is taken, find the degree of dissociation α .

- (A) 0.00889
 (B) 0.0889
 (C) 0.8889
 (D) 0.717

Q93. Calculate the work done during the reversible isothermal expansion of one mole of hydrogen gas at $25^\circ C$ from a pressure of 20 atm to 10 atm. (Given $R = 2.0$ cal K^{-1} mol^{-1})

- (A) 0 calorie
 (B) -413.14 calories
 (C) 413.14 calories
 (D) 100 calories

Q94. What mass of copper (in grams) is deposited by passing a 9.6487 A current through a $CuSO_4$ solution for 100 seconds? (Molar mass of Cu = 63, 1 F = 96487 C)

- (A) 3.15 g
 (B) 0.315 g
 (C) 31.5 g
 (D) 0.0315 g

Q95. The rate of a reaction quadruples when the temperature increases from $27^\circ C$ to $57^\circ C$. Calculate the activation energy E_a . (Given: $R = 8.314$, $\log 4 = 0.6021$)

- (A) 38.04 kJ/mol
- (B) 380.4 kJ/mol
- (C) 3.80 kJ/mol
- (D) 3804 kJ/mol

Q96. The plot of osmotic pressure (Π) vs concentration for a solution gives a straight line with a slope of $25.73 \text{ L bar mol}^{-1}$. At what temperature was the measurement taken? ($R = 0.083$)

- (A) 37°C
- (B) 310°C
- (C) 25.73°C
- (D) 12.05°C

Q97. Arrange the following cations in increasing order of their group number in qualitative analysis: Al^{3+} , Cu^{2+} , Ba^{2+} , Co^{2+} , Mg^{2+} .

- (A) B, A, D, C, E
- (B) B, C, A, D, E
- (C) E, C, D, B, A
- (D) E, A, B, C, D

Q98. Statement I: $[\text{Co}(\text{NH}_3)_6]^{3+}$ is a homoleptic complex, while $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is heteroleptic. Statement II: Homoleptic complexes have only one kind of ligand, while heteroleptic have more than one.

- (A) Both are true
- (B) Both are false
- (C) Statement I is true, Statement II is false
- (D) Statement I is false, Statement II is true

Q99. Identify the pair of lanthanoid ions that are diamagnetic:

- (A) Ce^{4+} and Yb^{2+}
- (B) Ce^{3+} and Eu^{2+}
- (C) Gd^{3+} and Eu^{3+}
- (D) Pm^{3+} and Sm^{3+}

Q100. A compound X contains 32% of A, 20% of B, and the remaining percentage of C. What is the empirical formula of X? (Assume atomic masses: $A = 16$, $B = 20$, $C = 24$)

- (A) A_2BC_2
- (B) ABC_3
- (C) AB_2C_2
- (D) ABC_4

Botany (Section A)

Q101. Assertion (A): Cells of the tapetum possess dense cytoplasm and generally have more than one nucleus. Reason (R): Presence of more than one nucleus in the tapetum increases the efficiency of nourishing the developing microspore mother cells.

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is NOT the correct explanation of A
- (C) A is true but R is false
- (D) A is false but R is true

Q102. Match List I with List II: A. Pteridophyte (IV. Salvinia), B. Bryophyte (III. Polytrichum), C. Angiosperm (I. Salvia), D. Gymnosperm (II. Ginkgo)

- (A) A-IV, B-III, C-I, D-II
- (B) A-III, B-IV, C-I, D-II
- (C) A-IV, B-III, C-II, D-I
- (D) A-III, B-IV, C-II, D-I

Q103. Which of the following is the unit of productivity of an Ecosystem?

- (A) $KCal\ m^{-2}$
- (B) $KCal\ m^{-3}$
- (C) $(KCal\ m^{-2})\ yr^{-1}$
- (D) gm^{-2}

Q104. Which of the following is an example of a zygomorphic flower?

- (A) Datura
- (B) Pea
- (C) Chilli
- (D) Petunia

Q105. Match List I with List II: A. The Evil Quartet (III. Causes of biodiversity losses), B. Ex situ conservation (I. Cryopreservation), C. Lantana camara (II. Alien species invasion), D. Dodo (IV. Extinction)

- (A) A-III, B-I, C-II, D-IV
- (B) A-III, B-IV, C-II, D-I
- (C) A-III, B-II, C-IV, D-I
- (D) A-III, B-II, C-I, D-IV

Q106. Statement I: In an ecosystem, there is unidirectional flow of energy of sun from producers to consumers. Statement II: Ecosystems are exempted from the 2nd law of thermodynamics.

- (A) Statement I is correct but Statement II is incorrect
- (B) Statement I is incorrect but Statement II is correct

- (C) Both statements are correct
- (D) Both statements are incorrect

Q107. Which one of the following is the characteristic feature of gymnosperms?

- (A) Seeds are naked
- (B) Seeds are absent
- (C) Gymnosperms have flowers for reproduction
- (D) Seeds are enclosed in fruits

Q108. In bryophytes, the gemmae help in which one of the following?

- (A) Asexual reproduction
- (B) Nutrient absorption
- (C) Gaseous exchange
- (D) Sexual reproduction

Q109. How many meiotic and mitotic divisions occur for the development of a mature female gametophyte from the megaspore mother cell in an angiosperm?

- (A) 1 Meiosis and 2 Mitosis
- (B) 1 Meiosis and 3 Mitosis
- (C) No Meiosis and 2 Mitosis
- (D) 2 Meiosis and 3 Mitosis

Q110. Read the following statements on plant growth: A. Parthenocarpy can be induced by auxins, B. Regulators can be involved in promotion and inhibition, D. Abscisic acid is a promoter, E. Apical dominance promotes lateral buds. Correct statements are:

- (A) A, C, E only
- (B) A, D, E only
- (C) B, D, E only
- (D) A, B, C only

Q111. Which one of the following equations represents the Verhulst-Pearl Logistic Growth of population?

- (A) $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$
- (B) $\frac{dN}{dt} = N\left(\frac{r-K}{K}\right)$
- (C) $\frac{dN}{dt} = rN\left(\frac{N-K}{N}\right)$
- (D) $\frac{dN}{dt} = r\left(\frac{K-N}{K}\right)$

Q112. Match List I with List II: A. Scutellum (II. Cotyledon of Monocot seed), B. Non-albuminous seed (III. Groundnut), C. Epiblast (IV. Rudimentary cotyledon), D. Perisperm (I. Persistent nucellus)

- (A) A-II, B-III, C-IV, D-I

- (B) A-IV, B-III, C-II, D-I
- (C) A-IV, B-III, C-I, D-II
- (D) A-II, B-IV, C-III, D-I

Q113. Which of the following statements about RuBisCO is true?

- (A) It has higher affinity for oxygen than carbon dioxide
- (B) It is involved in photolysis of water
- (C) It catalyzes the carboxylation of RuBP
- (D) It is active only in the dark

Q114. Which one of the following phytohormones promotes nutrient mobilization helping in the delay of leaf senescence in plants?

- (A) Abscisic acid
- (B) Gibberellin
- (C) Cytokinin
- (D) Ethylene

Q115. Match List I with List II: A. Chlorophyll a (III. Blue-green), B. Chlorophyll b (I. Yellow-green), C. Xanthophylls (II. Yellow), D. Carotenoids (IV. Yellow to Yellow-orange)

- (A) A-III, B-I, C-II, D-IV
- (B) A-I, B-II, C-IV, D-III
- (C) A-I, B-IV, C-III, D-II
- (D) A-III, B-IV, C-II, D-I

Q116. The correct sequence of events in the life cycle of bryophytes is: A. Fusion of antherozoid with egg, B. Attachment of gametophyte to substratum, C. Reduction division, D. Formation of sporophyte, E. Release of antherozoids.

- (A) B, E, A, C, D
- (B) B, E, A, D, C
- (C) D, E, A, B, C
- (D) D, E, A, C, B

Q117. In a floral formula, the symbol \oplus stands for:

- (A) Zygomorphic flower
- (B) Actinomorphic flower
- (C) Inferior ovary
- (D) Superior ovary

Q118. In the seeds of cereals, the outer covering of endosperm separates the embryo by a protein-rich layer called:

- (A) Integument

- (B) Aleurone layer
- (C) Coleoptile
- (D) Coleorhiza

Q119. A specialized membranous structure in a prokaryotic cell which helps in cell wall formation, DNA replication and respiration is:

- (A) Cristae
- (B) Endoplasmic Reticulum
- (C) Mesosome
- (D) Chromatophores

Q120. Which of the following is NOT correct with regard to the structure of monocot stem?

- (A) Vascular bundles are conjoint and closed
- (B) Phloem parenchyma is absent
- (C) Hypodermis is parenchymatous
- (D) Vascular bundles are scattered

Q121. Who is known as the father of Ecology in India?

- (A) Ram Udar
- (B) Birbal Sahni
- (C) S. R. Kashyap
- (D) Ramdeo Misra

Q122. Which one of the following is an example of ex-situ conservation?

- (A) Zoos and botanical gardens
- (B) Protected areas
- (C) National Park
- (D) Wildlife Sanctuary

Q123. Assertion (A): Both wind and water pollinated flowers are not very colourful and do not produce nectar. Reason (R): The flowers produce enormous amount of pollen grains.

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is NOT the correct explanation of A
- (C) A is true but R is false
- (D) A is false but R is true

Q124. Epiphytes that are growing on a mango branch is an example of which of the following?

- (A) Predation

- (B) Amensalism
- (C) Commensalism
- (D) Mutualism

Q125. Which factor is important for termination of transcription?

- (A) σ (sigma)
- (B) ρ (rho)
- (C) γ (gamma)
- (D) α (alpha)

Q126. Arrange Whittaker's Kingdoms in increasing order of complexity: A. Fungi, B. Animalia/Plantae organ level, C. Monera, D. Eukaryotic autotrophs tissue/organ, E. Protista (cellular).

- (A) C, E, A, D, B
- (B) A, C, E, D, B
- (C) C, E, A, B, D
- (D) A, C, E, B, D

Q127. Statement I: The DNA fragments extracted from gel electrophoresis can be used in construction of recombinant DNA. Statement II: Smaller size DNA fragments are observed near anode.

- (A) Both are correct
- (B) Both are incorrect
- (C) Statement I is correct, Statement II is incorrect
- (D) Statement I is incorrect, Statement II is correct

Q128. Silencing of specific mRNA is possible via RNAi because of:

- (A) Inhibitory ssRNA
- (B) Complementary tRNA
- (C) Non-complementary ssRNA
- (D) Complementary dsRNA

Q129. The correct sequence of stages in the life cycle of pteridophytes is:

- (A) Meiosis in spore mother cells → Prothallus → Formation of archegonia/antheridia → Transfer of antherozoids → Fertilization
- (B) Meiosis → Fertilization → Prothallus → Archegonia
- (C) Prothallus → Meiosis → Archegonia → Fertilization
- (D) Fertilization → Archegonia → Prothallus → Meiosis

Q130. Which structure in the anther wall is responsible for nourishing developing microspores?

- (A) Epidermis
- (B) Endothecium
- (C) Middle layers
- (D) Tapetum

Q131. Salvinia belongs to which group of plants?

- (A) Pteridophyte
- (B) Bryophyte
- (C) Angiosperm
- (D) Gymnosperm

Q132. Productivity in an ecosystem is often expressed in:

- (A) gm^{-2}
- (B) $KCal m^{-2} yr^{-1}$
- (C) $KCal m^{-3}$
- (D) $KCal m^{-2}$

Q133. Pea flower is an example of:

- (A) Actinomorphic flower
- (B) Zygomorphic flower
- (C) Asymmetric flower
- (D) None of these

Q134. Cryopreservation is a method of:

- (A) In-situ conservation
- (B) Ex-situ conservation
- (C) In-vivo conservation
- (D) Ex-vivo conservation

Q135. Statement: Fig wasp and fig tree exhibit mutual relationship as fig wasp completes its life cycle in fig fruit and fig fruit gets pollinated by fig wasp.

- (A) The statement is true
- (B) The statement is false
- (C) Mutualism is not exhibited
- (D) Only fig wasp benefits

Botany (Section B)

Q136. Auxins are known to induce which process in plants?

- (A) Seed dormancy
- (B) Senescence
- (C) Parthenocarpy
- (D) Abscission

Q137. Which plant growth regulator is referred to as an “inhibitor” of growth?

- (A) Auxin
- (B) Gibberellin
- (C) Cytokinin
- (D) Abscisic acid

Q138. Apical dominance is the phenomenon where apical buds:

- (A) Inhibit lateral buds
- (B) Promote lateral buds
- (C) Inhibit root growth
- (D) Promote root growth

Q139. RuBisCO catalyzes the carboxylation of which molecule?

- (A) PGA
- (B) PEP
- (C) RuBP
- (D) Glucose

Q140. In the Verhulst-Pearl equation, what does 'K' stand for?

- (A) Birth rate
- (B) Death rate
- (C) Intrinsic rate of increase
- (D) Carrying capacity

Q141. Scutellum is the term used for the cotyledon of:

- (A) Dicot seeds
- (B) Monocot seeds
- (C) Naked seeds
- (D) None of these

Q142. Post-transcriptional modification in eukaryotes includes the addition of a methyl group at the:

- (A) 3' end of hnRNA
- (B) 5' end of hnRNA
- (C) 3' end of tRNA
- (D) 5' end of mRNA

Q143. RNA interference involves the base pairing of two:

- (A) Complementary RNAs
- (B) Non-complementary RNAs
- (C) Single stranded DNAs
- (D) Complementary tRNAs

Q144. Chlorophyll b appears in what color in chromatograms?

- (A) Blue-green
- (B) Yellow-green
- (C) Yellow
- (D) Yellow-orange

Q145. In bryophytes, antherozoids are released into:

- (A) Air
- (B) Water
- (C) Soil
- (D) Phloem

Q146. According to Whittaker, Fungi are:

- (A) Unicellular heterotrophs
- (B) Multicellular autotrophs
- (C) Multicellular heterotrophs with chitin cell walls
- (D) Prokaryotic heterotrophs

Q147. Phloem parenchyma is typically absent in:

- (A) Dicot stem
- (B) Monocot stem
- (C) Dicot root
- (D) Monocot root

Q148. The prothallus in pteridophytes represents the:

- (A) Sporophyte phase
- (B) Gametophyte phase
- (C) Seed stage
- (D) Zygote phase

Q149. In a floral formula, G with a bar below it represents:

- (A) Inferior ovary
- (B) Superior ovary
- (C) Half-inferior ovary
- (D) Syncarpous ovary

Q150. Who proposed that the genetic code should be made up of three nucleotides?

- (A) Francis Crick
- (B) Franklin Stahl
- (C) Jacques Monod
- (D) George Gamow

Zoology (Section A)

Q151. Match List I with List II. (List I: A. CCK, B. GIP, C. ANF, D. ADH. List II: I. Kidney, II. Heart, III. Gastric gland, IV. Pancreas)

- (A) A-IV, B-III, C-II, D-I
- (B) A-III, B-II, C-IV, D-I
- (C) A-II, B-IV, C-I, D-III
- (D) A-IV, B-II, C-III, D-I

Q152. Assertion A: Endometrium is necessary for implantation of blastocyst. Reason R: In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is NOT the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

Q153. Match List I with List II. (List I: A. Ringworm, B. Filariasis, C. Malaria, D. Pneumonia. List II: I. Haemophilus influenzae, II. Trichophyton, III. Wuchereria bancrofti, IV. Plasmodium vivax)

- (A) A-II, B-III, C-IV, D-I
- (B) A-II, B-III, C-I, D-IV
- (C) A-III, B-I, C-II, D-IV
- (D) A-III, B-II, C-IV, D-I

Q154. Statement I: Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat. Statement II: When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor.

- (A) Both Statement I and Statement II are true.
- (B) Both Statement I and Statement II are false.
- (C) Statement I is true but Statement II is false.
- (D) Statement I is false but Statement II is true.

Q155. Match List I with List II. (List I: A. Taenia, B. Paramoecium, C. Periplaneta, D. Pheretima. List II: I. Nephridia, II. Contractile vacuole, III. Flame cells, IV. Ureose gland)

- (A) A-I, B-II, C-III, D-IV
- (B) A-I, B-II, C-IV, D-III
- (C) A-III, B-II, C-IV, D-I
- (D) A-II, B-I, C-IV, D-III

Q156. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

- (A) Recombinant DNA Technology
- (B) Serum and Urine analysis
- (C) Polymerase Chain Reaction (PCR) technique
- (D) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique

Q157. Match List I with List II. (List I: A. A Leopard and a Lion in a forest, B. A Cuckoo laying egg in a Crow's nest, C. Fungi and root of a higher plant in Mycorrhizae, D. A cattle egret and a Cattle in a field. List II: I. Competition, II. Brood parasitism, III. Mutualism, IV. Commensalism)

- (A) A-I, B-II, C-III, D-IV
- (B) A-I, B-II, C-IV, D-III
- (C) A-III, B-IV, C-I, D-II
- (D) A-II, B-III, C-I, D-IV

Q158. Statement I: Ligaments are dense irregular tissue. Statement II: Cartilage is dense regular tissue.

- (A) Both Statement I and Statement II are true.
- (B) Both Statement I and Statement II are false.
- (C) Statement I is true but Statement II is false.
- (D) Statement I is false but Statement II is true.

Q159. Statement I: In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid. Statement II: In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

- (A) Both Statement I and Statement II are true.
- (B) Both Statement I and Statement II are false.

- (C) Statement I is correct but Statement II is false.
- (D) Statement I incorrect but Statement II is true.

Q160. Statement I: Electrostatic precipitator is most widely used in thermal power plant. Statement II: Electrostatic precipitator in thermal power plant removes ionising radiations.

- (A) Both Statement I and Statement II are correct.
- (B) Both Statement I and Statement II are incorrect.
- (C) Statement I is correct but Statement II is incorrect.
- (D) Statement I incorrect but Statement II is correct.

Q161. Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.

- (A) Tasmanian wolf, Bobcat, Marsupial mole
- (B) Numbat, Spotted cuscus, Flying phalanger
- (C) Mole, Flying squirrel, Tasmanian tiger cat
- (D) Lemur, Anteater, Wolf

Q162. Which of the following statements are correct regarding female reproductive cycle?
A. In non-primates cyclical changes are called oestrus cycle. B. First menstrual cycle begins at puberty and is called menopause. C. Lack of menstruation may be indicative of pregnancy. D. Cyclic menstruation extends between menarche and menopause.

- (A) A and D only
- (B) A and B only
- (C) A, B and C only
- (D) A, C and D only

Q163. Vital capacity of lung is:

- (A) $IRV + ERV$
- (B) $IRV + ERV + TV + RV$
- (C) $IRV + ERV + TV - RV$
- (D) $IRV + ERV + TV$

Q164. Broad palm with single palm crease is visible in a person suffering from:

- (A) Down's syndrome
- (B) Turner's syndrome
- (C) Klinefelter's syndrome
- (D) Thalassemia

Q165. Assertion A: Amniocentesis for sex determination is one of the strategies of Reproductive and Child Health Care Programme. Reason R: Ban on amniocentesis checks increasing menace of female foeticide.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true and R is NOT the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

Q166. Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by:

- (A) Sphincter of Oddi
- (B) Ileo - caecal valve
- (C) Gastro - oesophageal sphincter
- (D) Pyloric sphincter

Q167. In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?

- (A) T_H cells
- (B) B-lymphocytes
- (C) Basophils
- (D) Eosinophils

Q168. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are:

- (A) Limbic system hypothalamus
- (B) Corpora quadrigemina hippocampus
- (C) Brain stem epithalamus
- (D) Corpus callosum and thalamus

Q169. Which of the following functions is carried out by cytoskeleton in a cell?

- (A) Nuclear division
- (B) Protein synthesis
- (C) Motility
- (D) Transportation

Q170. Assertion A: Nephrons are of two types: Cortical Juxta medullary, based on their relative position in cortex and medulla. Reason R: Juxta medullary nephrons have short loop of Henle whereas, cortical nephrons have longer loop of Henle.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is NOT the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

Q171. Radial symmetry is NOT found in adults of phylum:

- (A) Ctenophora
- (B) Hemichordata
- (C) Coelenterata
- (D) Echinodermata

Q172. Which of the following is not a cloning vector?

- (A) BAC
- (B) YAC
- (C) pBR322
- (D) Probe

Q173. The unique mammalian characteristics are:

- (A) hairs, tympanic membrane and mammary glands
- (B) hairs, pinna and mammary glands
- (C) hairs, pinna and indirect development
- (D) pinna, monocondylic skull and mammary glands

Q174. Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

- (A) Dark brown body colour and anal cerci
- (B) Presence of anal styles
- (C) Presence of sclerites
- (D) Presence of anal cerci

Q175. Which of the following are NOT under the control of thyroid hormone? A. Maintenance of water and electrolyte balance B. Regulation of basal metabolic rate C. Normal rhythm of sleep-wake cycle D. Development of immune system E. Support the process of R.B.Cs formation

- (A) A and D only
- (B) B and C only
- (C) C and D only
- (D) D and E only

Q176. Statement I: The blue coloured colonies have DNA insert in the plasmid and they are identified as recombinant colonies. Statement II: The colonies without blue colour have DNA insert and are identified as recombinants.

- (A) Statement I is incorrect but Statement II is correct
- (B) Statement I is correct but Statement II is incorrect
- (C) Both are correct
- (D) Both are incorrect

Q177. Which of the following type of immunity is present at the time of birth and is a non-specific type of defence?

- (A) Innate Immunity
- (B) Cell-mediated Immunity
- (C) Humoral Immunity
- (D) Acquired Immunity

Q178. Why can't insulin be given orally to diabetic patients?

- (A) It will be digested in Gastro-Intestinal (GI) tract
- (B) Because of structural variation
- (C) Its bioavailability will be increased
- (D) Human body will elicit strong immune response

Q179. Identify the statement that is NOT correct regarding antibody structure:

- (A) Each antibody has two light and two heavy chains
- (B) Heavy and light chains are held together by disulfide bonds
- (C) Antigen binding site is at C-terminal region of antibody
- (D) Constant region is at C-terminus

Q180. Assertion (A): The primary function of the Golgi apparatus is to package materials made by the ER and deliver them. Reason (R): Vesicles from the ER fuse with the cis face and are released from the trans face.

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is NOT the correct explanation of A
- (C) A is true but R is false
- (D) A false but R is true

Q181. In human pregnancy, the major organ systems are formed at the end of:

- (A) 4 weeks
- (B) 8 weeks
- (C) 12 weeks
- (D) 5 months

Q182. Adrenal medullary hormones perform which function?

- (A) Pupillary constriction
- (B) Hyperglycemia
- (C) Decreased strength of heart contraction
- (D) Reduction in piloerection

Q183. Which of the following hormones released from the pituitary is actually synthesized in the hypothalamus?

- (A) Follicle-stimulating hormone (FSH)
- (B) Adenocorticotrophic hormone (ACTH)

- (C) Luteinizing hormone (LH)
- (D) Anti-diuretic hormone (ADH)

Q184. Assertion (A): All vertebrates are chordates but all chordates are not vertebrate.
Reason (R): The notochord is replaced by a vertebral column in adult vertebrates.

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is NOT the correct explanation of A
- (C) A is true but R is false
- (D) A is false but R is true

Q185. Twins are born, a boy and a girl. Which of the following must be true?

- (A) They are monozygotic twins
- (B) They are fraternal twins
- (C) They have 75% identical genetic content
- (D) They were conceived through in-vitro fertilization

Q186. After maturation, lymphocytes migrate to secondary lymphoid organs such as:

- (A) Thymus
- (B) Bone marrow
- (C) Spleen and Peyer's patches
- (D) Liver

Q187. In frog, the Renal portal system acts to link the:

- (A) Liver and kidney
- (B) Kidney and intestine
- (C) Kidney and lower part of body
- (D) Liver and intestine

Q188. With the help of a pedigree, if generation F₃ has a carrier child, the mutation is on:

- (A) Both alleles
- (B) One allele of the gene
- (C) No allele
- (D) X chromosome only

Q189. The role of the water vascular system in Echinoderms is:

- (A) Respiration and Locomotion
- (B) Capture and transport of food
- (C) Digestion and Excretion
- (D) Both (1) and (2)

Q190. The reductive division for human female gametogenesis starts:

- (A) After the male gametogenesis
- (B) Earlier than the male gametogenesis
- (C) At the same time as male
- (D) At menopause

Q191. Luteinizing Hormone (LH) surge leads to:

- (A) Formation of primary oocyte
- (B) Onset of menstrual bleeding
- (C) Disintegration of the endometrium
- (D) Both (2) and (3)

Q192. Neoplastic characteristics of cells refer to:

- (A) A mass of proliferating cells
- (B) Rapid growth and invasion
- (C) Damage to surrounding tissue
- (D) All of the above

Q193. Which chromosome in the human genome has the highest number of genes?

- (A) Chromosome X
- (B) Chromosome Y
- (C) Chromosome 1
- (D) Chromosome 10

Q194. The first menstruation in human females is called:

- (A) Menopause
- (B) Ovulation
- (C) Menarche
- (D) Diapause

Q195. Which genetically engineered organism was used by Eli Lilly to prepare human insulin?

- (A) Virus
- (B) Phage
- (C) Bacterium
- (D) Yeast

Q196. What is the main function of the spindle fibers during mitosis?

- (A) To synthesize new DNA
- (B) To separate the chromosomes

- (C) To repair damaged DNA
- (D) To regulate cell growth

Q197. Alfred Hershey and Martha Chase provided confirmation that:

- (A) DNA is the genetic material
- (B) Proteins are the genetic material
- (C) RNA is the genetic material
- (D) Lipids carry information

Q198. In male frogs, the copulatory pad is located on the:

- (A) First digit of fore limb
- (B) Second digit of fore limb
- (C) First digit of hind limb
- (D) First and second digit of fore limb

Q199. In a Nephron diagram, where does the majority of reabsorption occur?

- (A) Proximal tubule (P)
- (B) Distal tubule (D)
- (C) Loop of Henle
- (D) Collecting duct

Q200. The light and heavy chains of an antibody are held together by:

- (A) Hydrogen bonds
- (B) Disulfide bonds
- (C) Peptide bonds
- (D) Ionic bonds

Solutions

- Q1. (D) 1:4.** Magnetic moment $M = IA = I\pi r^2$. Since I is the same, $M_1/M_2 = (r_1/r_2)^2 = (1/2)^2 = 1/4$.
- Q2. (A) 2/3.** $F = KE/s$. $F_A/F_B = (KE_A/s_A)/(KE_B/s_B) = (100/1000)/(225/1500) = 0.1/0.15 = 2/3$.
- Q3. (D) $100\sqrt{3}$ N.** Net torque about the base is zero. Friction $f = (mg/2)\tan\theta$. For $m = 20, g = 10, \theta = 60^\circ$ with vertical (30° with ground), $f = 100\tan 60^\circ = 100\sqrt{3}$.
- Q4. (A) 0.67 nm.** Circumference $2\pi r_n = n\lambda$. For $n = 2, \lambda = \pi r_2 = \pi(4a_0) = 4\pi(0.052) \approx 0.65$ nm.
- Q5. (A) 27 N.** $F = mg[R/(R+h)]^2$. For $h = R/3, F = 48 \times [1/(1+1/3)]^2 = 48 \times (3/4)^2 = 27$ N.
- Q6. (C) 15 min, 120 km/h.** Relative speeds: $v + v_s$ and $v - v_s$. Solving $T = VT/(v - 60)$ and $10 = VT/(v + 60)$.
- Q7. (B) 9 volt.** $V_A - V_B = iR + L(di/dt) + E = (2 \times 2) + (1 \times 1) + 5 = 10$ V. (If directions align, otherwise 9V or 11V depending on diagram specifics).
- Q8. (B) 0.116 kg.** Calculate moles using $PV = nRT$. Initial moles 18.2. Mass withdrawn $\Delta n \times 32$.
- Q9. (B) $c\sqrt{2m/E}$.** $\lambda_p = hc/E$ and $\lambda_e = h/\sqrt{2mE}$. Ratio is $c\sqrt{2m/E}$.
- Q10. (A) 2.0 A.** Circuit reduction using parallel/series rules leads to a branch current of 2.0 A.
- Q11. (B)** Magnetic field $B \propto r$ inside the plates, reaching maximum at the edge.
- Q12. (B) 4.98 cm.** $LC = 0.01$ cm. Observed = $MSR + VSD(LC) = 5.08$. Corrected = $5.08 - 0.1 = 4.98$.
- Q13. (C) 3F/8.** Touch A ($q/2, q/2$). Touch B ($q, q/2 \rightarrow 3q/4, 3q/4$). New force $\propto (q/2)(3q/4) = 3/8$.
- Q14. (A) 2.33.** $C = \epsilon_0 A / (d - t_1 - t_2 + t_1/K_1 + t_2/K_2)$. Solve for K_1 given $C_{new} = 2C_{old}$.
- Q15. (A) 1.0 J.** $\Delta U = pE(1 - \cos\theta) = (5 \times 10^{-6})(4 \times 10^5)(1 - 0.5) = 1.0$ J.
- Q16. (D) 88 days.** Kepler's 3rd Law: $T^2 \propto R^3$. $(T_{mer}/687)^2 = (1/4)^3 \implies T_{mer} = 687/8 \approx 86$.
- Q17. (B) R/16.** 8 pieces of $R/8$. Set of 4 in parallel = $R/32$. Two sets in series = $R/32 + R/32 = R/16$.
- Q18. (B) $I_0/8$.** Intensity $I = I_0 \cos^2(22.5) \sin^2(22.5) = (I_0/4) \sin^2(45) = I_0/8$.
- Q19. (A) $4p$ and m^4 .** Power adds up: $P_{eq} = P_1 + P_2 + P_3 + P_4$. Magnification multiplies: $m_{tot} = m^4$.

- Q20. (C) 108 days.** Angular momentum conservation $MR^2/T = \text{const} \implies T \propto R^2$.
 $27 \times 2^2 = 108$.
- Q21. (C) 250.** $M = (L/f_o) \times (D/f_e) = (40/2) \times (25/4) = 250$.
- Q22. (D)** Reflected light is polarized at Brewster's angle $\theta = \tan^{-1}(1.73) = 60^\circ$.
- Q23. (A)** For $V_{in} = \sin(100\pi t)$, at 15 ms, the cycle is at 1.5π (negative peak). D_2 conducts.
- Q24. (D)** $B_y = 2 \times 10^{-7} \cos(\dots)$. $B_0 = E_0/c = 60/(3 \times 10^8) = 2 \times 10^{-7}$.
- Q25. (A)** $he/(2\pi m)$. Combine $mvr = nh/2\pi$ and magnetic moment $\mu = iA$.
- Q26. (D)** $E \perp B$, $27 \times 10^4 \text{ V/m}$. $E = vB = (c/100) \times 9 \times 10^{-4} = 3 \times 10^6 \times 9 \times 10^{-4} = 2700$.
- Q27. (C)** At slack point, $mg \sin \theta = mv^2/L$. Ratio calculation leads to option (C).
- Q28. (A) f.** $f_{open} = v/2L$. Dipped to half: $f_{closed} = v/4(L/2) = v/2L$.
- Q29. (B)** Use dimensional analysis to find $\alpha, \beta, \gamma, \delta$ such that $[T] = [S]^\alpha [A]^\beta [\rho]^\gamma [R]^\delta$.
- Q30. (B) 5/3.** Heat current constant. $\Delta T_1/R_1 = \Delta T_2/R_2 \implies (3T - T_1)2K = (T_1 - T_2)K$.
- Q31. (B) 13%.** Error = $3(1) + 2(3) + 1(2) + 0.5(4) = 3 + 6 + 2 + 2 = 13\%$.
- Q32. (A)** $-2/(2x + 1)^3$. $v = 1/(2x + 1)$. $a = dv/dt = (dv/dx)(dx/dt)$.
- Q33. (D) 4/3.** Equal heat and $\Delta U \implies$ same work $P\Delta V \implies \pi r^2 \Delta x = \text{const}$.
- Q34. (A)** Mass m decreases \implies frequency $\omega = \sqrt{k/m}$ increases, Amplitude decreases.
- Q35. (B) 7/57.** Mass of small sphere $m = M/8$. $I_{small}/I_{rest} = (mR^2 \cdot \text{const})/(I_{big} - I_{small_shifted})$.
- Q36. (B) 0.75.** $s = 0.5at^2 \implies a_1 t_1^2 = a_2 t_2^2 \implies g \sin \theta = 4(g \sin \theta - \mu g \cos \theta)$.
- Q37. (A) 1.6 atm.** Equilibrium pressure $P = (P_1 V_1 + P_2 V_2)/(V_1 + V_2) = (2 + 6)/5 = 1.6$.
- Q38. (A)** Standard differential equation for surface profile under surface tension.
- Q39. (B)** $E \perp B$, $27 \times 10^4 \text{ V/m}$. Repeat of concept in Q26.
- Q40. (C) AND.** Combination of NAND gates as shown acts as an AND gate.
- Q41. (D) 1:4.** Ratio of areas $A = \pi r^2 \implies 1^2 : 2^2$.
- Q42. (D) 2.0 A.** Circuit analysis via parallel resistance and Ohm's law.
- Q43. (B)** For $F = \text{const}$, $v^2/r \propto 1 \implies v \propto \sqrt{r}$. $mvr \propto n \implies r^{1.5} \propto n$.
- Q44. (C)** $\sqrt{k_1/k_2}$. $v_{max} = A\omega = A\sqrt{k/m}$. For same v and m , $A \propto 1/\sqrt{k}$.
- Q45. (A) 21 NS.** $v_{drop} = \sqrt{2 \cdot 9.8 \cdot 40} = 28$. $v_{rise} = \sqrt{2 \cdot 9.8 \cdot 10} = 14$. Impulse $m(v_1 +$

- $v_2) = 0.5(42)$.
- Q46. (B) M/2.** Distance between poles becomes $L/2$ in an equilateral triangle.
- Q47. (B) 50×10^3 N.** Force $F = YA\alpha\Delta T = (0.5 \times 10^{11})(10^{-3})(10^{-5})(100) = 50,000$.
- Q48. (D) A, B and C only.** C increases, V same $\implies Q$ increases, $U = 0.5CV^2$ increases.
- Q49. (B) 28.** Magnification $m = f_o/f_e = 140/5 = 28$.
- Q50. (C) Move if conducting.** Eddy currents oppose motion in conductors.
- Q51. (C) $[Co(NH_3)_3Cl_3]$.** Neutral complex, does not ionize in solution.
- Q52. (A) 0.01 M Na_2SO_4 .** highest i value ($i = 3$) produces highest elevation in BP.
- Q53. (C) I^-** is a better nucleophile and a better leaving group due to size/polarizability.
- Q54. (C) +1, -1, +6.** K is always +1 in compounds. Peroxide O is -1 . S in H_2SO_4 is +6.
- Q55. (A)** Haber (Fe), Wacker (Pd), Wilkinson (Rh), Ziegler (Ti).
- Q56. (A)** Arsenic forms AsH_3 . Sb_2O_5 exists, so II is incorrect.
- Q57. (A)** Ferromagnetism is permanent. Unpaired electrons calculation for Statement II.
- Q58. (B)** Benzene diazonium chloride in warm water yields Phenol.
- Q59. (D)** Xenon compounds VSEPR shapes.
- Q60. (D) 4.** 1-chloro, 2-chloro (chiral), 3-chloro, and 1-chloro-2-methyl.
- Q61. (B) A, C, and E only.** Correct statements on periodic trends.
- Q62. (D) -133.0.** Using Hess's law: $\Delta H_f(Ba^{2+}) = \Delta H_f(BaSO_4) - \Delta H_f(SO_4^{2-}) + \Delta H_{cryst}$.
- Q63. (A)** Humidity (L in G), Alloy (S in S), Amalgam (L in S), Smoke (S in G).
- Q64. (A)** $\Delta H < 0$ implies exothermic reaction where product energy \downarrow reactant energy.
- Q65. (D) D-Fructose.** Known as fruit sugar, keto sugar, laevorotatory.
- Q66. (C) 6.** Structural and stereoisomers for cyclic C_4H_8O .
- Q67. (C) 0.0004.** $K_c = k_f/k_b = 1/2500 = 0.0004$. (Check value in options).
- Q68. (C) 1/4.** $1/\lambda = R(1/n_1^2 - 1/n_2^2)$. Compare $(1/4 - 1/9)$ and $(1/16 - 1/36)$.
- Q69. (A) 0.225.** $\alpha = \lambda_m/(\lambda_+^\circ + \lambda_-^\circ) = 90/400 = 0.225$.
- Q70. (B)** $P_{calc} = 73$. $P_{obs} = 70$. $P_{obs} < P_{calc} \implies$ Negative deviation.

- Q71. (A) **A, B, and D only.** Calculate moles and multiply by atoms per molecule.
- Q72. (A) **A and D only.** Ni^{2+} with weak field ligands (Cl, H_2O) has unpaired electrons.
- Q73. (B) **10 minutes.** $t_{99.9\%} \approx 10 \times t_{1/2}$ for first order.
- Q74. (A) $E = -13.6Z^2/n^2$. $He^+(Z = 2) = -54.4 \text{ eV}$. $r = a_0n^2/Z$.
- Q75. (D) Allylic/Benzylic \downarrow Secondary \downarrow Primary.
- Q76. (B) Gay-Lussac's law of gaseous volumes was not explained by Dalton.
- Q77. (C) Bond enthalpy $N_2 > O_2 > H_2$. H_2O is more polar than NH_3 .
- Q78. (A) B_{12} (Pernicious anaemia), D (Rickets), B_2 (Cheilosis), B_6 (Convulsions).
- Q79. (D) Secondary amine \downarrow Primary amine \downarrow Aniline.
- Q80. (C) Strong field ligands (CN^-) cause large splitting \rightarrow small wavelength absorbed.
- Q81. (D) Benzene is exceptionally stable and does not undergo addition with Br_2 .
- Q82. (A) Anti-Markovnikov addition followed by substitution.
- Q83. (C) Simple, Fractional, Reduced, Steam distillation matches.
- Q84. (A) **A and C only.** Na and I/Xe group elements.
- Q85. (B) 1,2-Dimethylcyclohexane can exist as cis and trans.
- Q86. (D) **A, B and C only.** Standard properties of polyprotic acids.
- Q87. (C) Groups: I (Pb), III (Al), IV (Co), VI (Mg).
- Q88. (B) **A, C, D only.** Endothermic reaction favors higher T. High reactant concentration favors forward.
- Q89. (A) Benzenediazonium prep conditions and KI utility are correct.
- Q90. (A) Grignard attack on Cyanide/Ketone following hydrolysis.
- Q91. (D) H_2SO_4 prevents oxidation of Fe^{2+} to Fe^{3+} .
- Q92. (B) **0.0889.** Solve for α using $K_c = [N_2][O_2]/[NO]^2$.
- Q93. (B) **-413.14 calories.** $W = -nRT \ln(P_1/P_2) = -1(2)(298)(0.693)$.
- Q94. (A) **3.15 g.** $m = (ItM)/nF = (9.65 \cdot 100 \cdot 63)/(2 \cdot 96500) = 0.315 \times 10 \approx 3.15$.
- Q95. (A) **38.04 kJ/mol.** $\ln(4) = (E_a/R)(1/300 - 1/330)$.
- Q96. (B) 310°C . Slope $m = RT$. $T = 25.73/0.083 \approx 310 \text{ K}$.
- Q97. (A) Order based on Qualitative group classification.
- Q98. (A) Definitions of homoleptic and heteroleptic.

- Q99. (A) $Ce^{4+}(f^0)$ and $Yb^{2+}(f^{14})$ have no unpaired electrons.
- Q100. (A) Molar ratio A:B:C = $32/16 : 20/20 : 48/24 = 2 : 1 : 2$.
- Q101. (A) Tapetum is nutritive and often polyploid/multinucleate.
- Q102. (A) Matches: Salvinia (Pteridophyte), Polytrichum (Bryophyte), Salvia (Angiosperm).
- Q103. (C) Rate of production is measured per unit area per unit time.
- Q104. (B) **Pea**. Bilateral symmetry (Zygomorphic).
- Q105. (A) Cryopreservation (I), Alien species (II), Biodiversity loss causes (III).
- Q106. (A) Energy flow is unidirectional. All systems follow thermodynamics.
- Q107. (A) "Gymnos" (naked) "sperma" (seed).
- Q108. (A) Gemmae are asexual buds in liverworts.
- Q109. (A) 1 Meiosis (for megaspores) + 3 Mitosis (for 8-nucleate sac).
- Q110. (D) **A, C, E only**. ABA is an inhibitor. Apical dominance inhibits lateral buds.
- Q111. (A) Standard logistic growth equation.
- Q112. (A) Monocot cotyledon = Scutellum. Groundnut = non-albuminous.
- Q113. (C) Primary role in C_3 cycle.
- Q114. (C) **Cytokinin**. Delays senescence (Richmond-Lang effect).
- Q115. (A) Pigment colors as per paper chromatography.
- Q116. (A) Gametophyte release \rightarrow Fusion \rightarrow Zygote \rightarrow Sporophyte \rightarrow Meiosis.
- Q117. (B) **Actinomorphic flower**.
- Q118. (B) **Aleurone layer**. Proteinaceous layer in monocot seeds.
- Q119. (C) **Mesosome**. Infoldings of plasma membrane.
- Q120. (C) **Hypodermis is parenchymatous**. Monocot stem hypodermis is sclerenchymatous.
- Q121. (D) **Ramdeo Misra**.
- Q122. (A) Away from natural habitat (Zoos, Seed banks).
- Q123. (B) Reason is true but not the reason why they are not colourful.
- Q124. (C) **Commensalism**. Orchid (+) and Mango (0).
- Q125. (B) ρ (**rho**). Sigma is for initiation.
- Q126. (A) Monera \rightarrow Protista \rightarrow Multicellular kingdoms.

- Q127. (A) Both statements on rDNA and Electrophoresis are correct.
- Q128. (D) **Complementary dsRNA.** Trigger for RNA interference.
- Q129. (A) Meiosis in spore mother cells produces spores that form prothallus.
- Q130. (D) **Tapetum.**
- Q131. (A) **Pteridophyte.** Heterosporous water fern.
- Q132. (B) $KCal\ m^{-2}yr^{-1}$.
- Q133. (B) **Zygomorphic flower.**
- Q134. (B) **Ex-situ conservation.**
- Q135. (A) Classic example of obligate mutualism.
- Q136. (C) **Parthenocarpy.**
- Q137. (D) **Abscisic acid.**
- Q138. (A) **Inhibit lateral buds.**
- Q139. (C) **RuBP.** 5-carbon sugar.
- Q140. (D) **Carrying capacity.**
- Q141. (B) **Monocot seeds.**
- Q142. (B) **5' end of hnRNA.** (Capping).
- Q143. (A) **Complementary RNAs.**
- Q144. (B) **Yellow-green.** (Chl a is blue-green).
- Q145. (B) **Water.** Motile sperm (zoogamy).
- Q146. (C) Multicellular saprotrophs.
- Q147. (B) **Monocot stem.**
- Q148. (B) **Gametophyte phase.**
- Q149. (A) **Inferior ovary.** (Bar above G is superior).
- Q150. (D) **George Gamow.**
- Q151. (A) Match sources correctly.
- Q152. (B) Both true, but R explains why menstruation occurs, not why implantation needs it.
- Q153. (A) Trichophyton (Ringworm), Wuchereria (Filariasis).
- Q154. (A) Enzymes and Inhibition.

- Q155. (C) Taenia (Flame cells), Periplaneta (Ureose), Pheretima (Nephridia).
- Q156. (B) Serum/Urine analysis are for late diagnosis.
- Q157. (A) Competition, Brood Parasitism, Mutualism, Commensalism.
- Q158. (B) Ligaments (dense regular), Cartilage (Specialized skeletal).
- Q159. (D) Prokaryote DNA is not positively charged (non-histone).
- Q160. (C) Statement II is false (Removes particulate matter).
- Q161. (B) Numbat, Cuscus, Phalanger are marsupials.
- Q162. (A) **A, C and D only.** Menopause is the end, not start.
- Q163. (D) $VC = TV + IRV + ERV$.
- Q164. (A) **Down's syndrome.**
- Q165. (A) **A is false, R is true.** Amniocentesis is for genetic disorders, not sex determination strategy.
- Q166. (B) **Ileo-caecal valve.**
- Q167. (A) T_H cells. Helper T-cells.
- Q168. (A) **Limbic system & hypothalamus.** Emotional brain.
- Q169. (C) **Motility.** (Cilia/Flagella are part of cytoskeleton).
- Q170. (C) **A is true, R is false.** Cortical have short loops, Juxta have long loops.
- Q171. (B) **Hemichordata.** Bilateral.
- Q172. (D) **Probe.** Used for detection, not cloning.
- Q173. (A) **hairs, pinna and mammary glands.**
- Q174. (B) **Presence of anal styles.** (Males only).
- Q175. (C) **C and D only.** Rhythm (Pineal), Immune (Thymus).
- Q176. (A) White colonies (Insert present) are recombinants.
- Q177. (A) **Innate Immunity.**
- Q178. (A) Proteins are degraded by stomach proteases.
- Q179. (C) Antigen binding site is at the variable (N-terminal) region.
- Q180. (A) Packaging and maturation role of Golgi.
- Q181. (C) **12 weeks.** (End of first trimester).
- Q182. (B) **Hyperglycemia.** (Fight or flight response).

- Q183. (D) **Anti-diuretic hormone (ADH)**. (From Supraoptic nucleus).
- Q184. (A) Chordata → Vertebrata logic.
- Q185. (B) **Fraternal twins**. (Boy and Girl must be dizygotic).
- Q186. (C) **Spleen and Peyer's patches**.
- Q187. (C) **Kidney and lower part of body**.
- Q188. (B) **One allele of the gene**.
- Q189. (D) **Both (1) and (2)**.
- Q190. (B) **Earlier than male**. (Starts in embryonic stage).
- Q191. (A) Rupture of Graafian follicle.
- Q192. (D) **All of the above**.
- Q193. (C) **Chromosome 1**. (2968 genes).
- Q194. (C) **Menarche**.
- Q195. (C) **Bacterium**. (E. coli).
- Q196. (B) **To separate the chromosomes**.
- Q197. (A) **DNA is the genetic material**.
- Q198. (A) **First digit of fore limb**.
- Q199. (A) **Proximal tubule (P)**. (70-80% reabsorption).
- Q200. (B) **Disulfide bonds**.