



# TECHNO INDIA GROUP PUBLIC SCHOOL

Dt. 04-04-2025

## NEET Mock Test - 3 (2025)

Time Allowed: **3 hours**

Maximum Marks: **720**

### General Instructions:

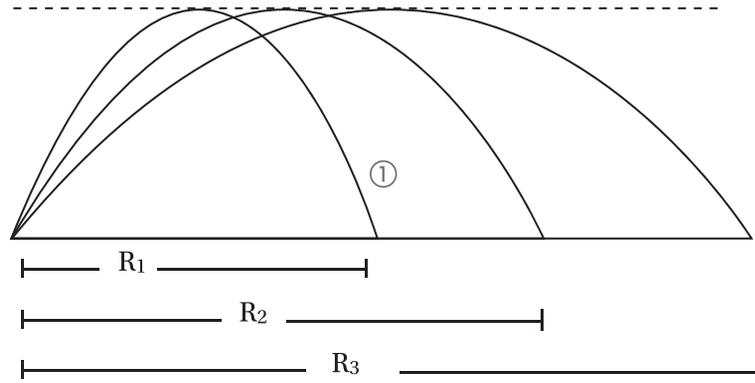
1. This test will be a 3 hours Test, Maximum Marks 720.
2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt.
3. Each question is of 4 marks.
4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).
5. There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattempted question.
6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.
7. All calculations / written work should be done in the rough sheet provided.



## PHYSICS

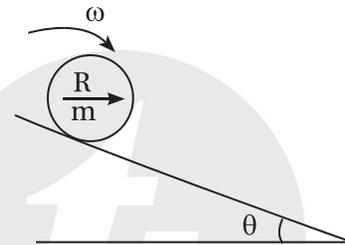
|    |  |
|----|--|
| 1. | Dimensions of self inductance are  |
|    | ① $MLT^{-2}A^{-3}$ ② $ML^2T^{-1}A^{-2}$ ③ $ML^2T^{-2}A^{-2}$ ④ $ML^2T^{-2}A^{-1}$  |
| 2. | A car travelling on a straight path moves with uniform velocity $v_1$ for some time and with velocity $v_2$ for next equal time, the average velocity is given by  |
|    | ① $\sqrt{v_1 \cdot v_2}$ ② $\frac{v_1 + v_2}{2}$ ③ $\left(\frac{1}{v_1} + \frac{1}{v_2}\right)^{-1}$ ④ $2\left(\frac{1}{v_1} + \frac{1}{v_2}\right)^{-1}$  |
| 3. | A car of mass $m$ is moving with momentum $P$ . If $\mu$ be the coefficient of friction between the tyres and the road, what will be stopping distance due to friction alone.  |
|    | ① $\frac{p^2}{2\mu g}$ ② $\frac{p^2}{2m\mu g}$ ③ $\frac{p^2}{2m^2\mu g}$ ④ $\frac{p^2}{2mg}$   |
| 4. | A neutron is moving with velocity $u$ . It collides head on and elastically with an atom of mass number $A$ . If the initial kinetic energy of the neutron be $E$ , how much kinetic energy will be retained by the neutron after collision ?  |
|    | ① $\left(\frac{A}{A+1}\right)^2 E$ ② $\frac{A}{(A+1)^2} E$ ③ $\left(\frac{A-1}{A+1}\right)^2 E$ ④ $\frac{A-1}{(A+1)^2} E$  |
| 5. | A satellite of mass $m$ is moving in a circular orbit of radius $R$ above the surface of a planet of mass $M$ and radius $R$ . The amount of work done to shift the satellite to higher orbit of radius $3R$ is  |
|    | ① $mgR$ ② $\frac{mgR}{6}$ ③ $\frac{mMgR}{(M+m)}$ ④ $\frac{mMgR}{6(M+m)}$   |
| 6. | A body executes simple harmonic motion under the action of force $F_1$ with a time period $\frac{4}{5}$ s. If the force is changed to $F_2$ , it executes SHM with time period $\frac{3}{5}$ s. If both forces $F_1$ and $F_2$ act simultaneously in the same direction on the body, its time period will be |
|    | ① $\frac{12}{25}$ s      ② $\frac{24}{25}$ s      ③ $\frac{35}{24}$ s      ④ $\frac{15}{12}$ s   |
| 7. | The distance of moon from the earth is about 60 times the radius of Earth. What will be the diameter of the earth (approximately in degrees) as seen from the moon?  |
|    | ① $1^\circ$ ② $2^\circ$ ③ $4^\circ$ ④ $6$  |
| 8. | A particle moves rectilinearly as $x^2 = at^2 + b$ where $a$ and $b$ are constants. Its acceleration at time $t$ is proportional to  |
|    | ① $\frac{1}{x^3}$ ② $\frac{1}{x} - \frac{1}{x^2}$ ③ $-\frac{1}{x^2}$ ④ $\frac{1}{x} - \frac{t^2}{x^3}$   |

9. Three projectiles are projected with different speed at different angle of projections, with initial speeds  $u_1$ ,  $u_2$  and  $u_3$ . Then



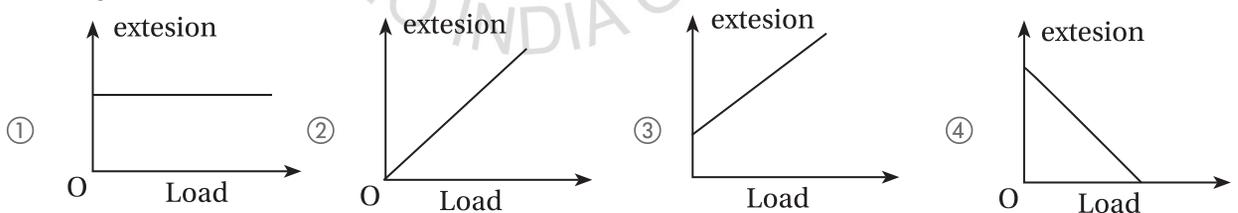
- ①  $u_1 > u_2 > u_3$       ②  $u_2 > u_3 > u_1$       ③  $u_3 > u_1 > u_2$       ④  $u_3 > u_2 > u_1$

10. Minimum value of coefficient of friction required for pure rolling  $\mu_{\min} =$

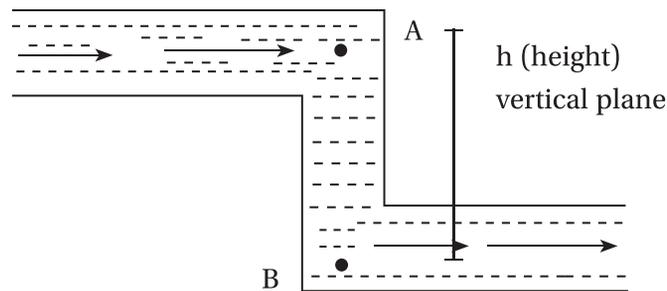


- ①  $\tan\theta$       ②  $\frac{\tan\theta}{1 - \frac{mR^2}{I}}$       ③  $\frac{\tan\theta}{1 + \frac{mR^2}{I}}$       ④  $\frac{2\tan\theta}{\left(\frac{mR^2}{I}\right)}$

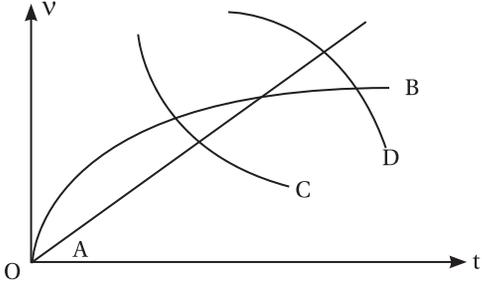
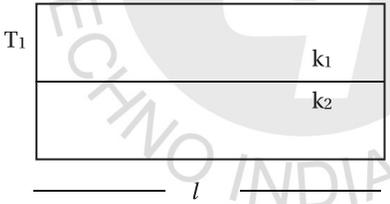
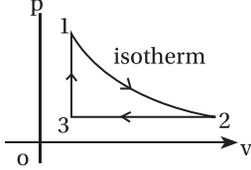
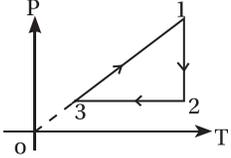
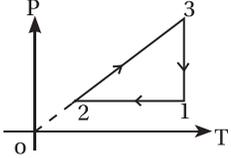
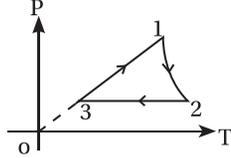
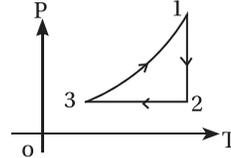
11. Within elastic limit, which of the following graphs correctly represents the variation of extension in the length of a wire with the external load?

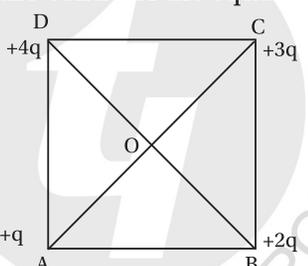
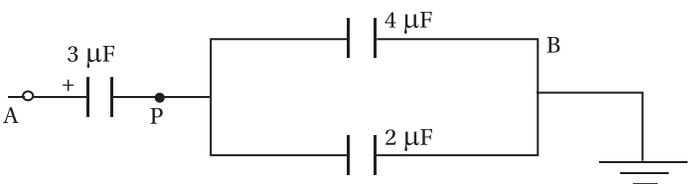
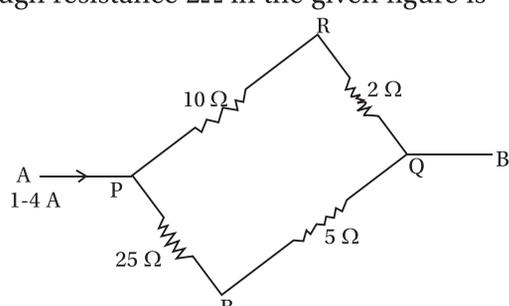


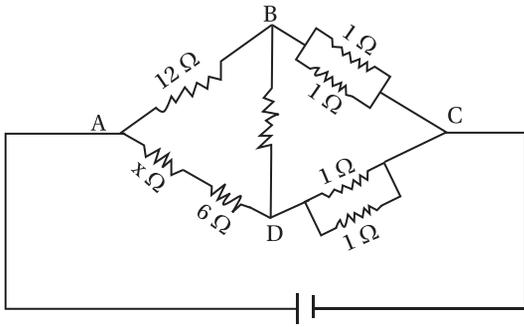
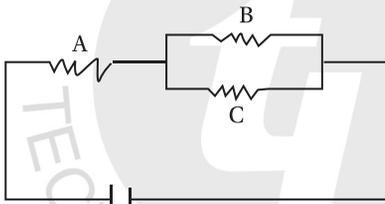
12. In the figure shown an ideal liquid is flowing through the tube which is of uniform area of cross-section. The liquid has velocities  $V_A$  and  $V_B$  and pressures  $P_A$  and  $P_B$  at points A and B respectively. Then



- ①  $V_B > V_A$       ②  $V_B = V_A$       ③  $p_B < p_A$       ④  $p_B = p_A$

|     |   |
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| 13. | <p>A drop of liquid of density <math>\rho</math> is floating half immersed in a liquid of density <math>\sigma</math> and surface tension <math>7.5 \times 10^{-4} \text{ N cm}^{-1}</math>. The radius of drop (in cm) will be (<math>g = 10 \text{ m/s}^2</math>)</p> <p>① <math>\frac{15}{\sqrt{(2\rho - \sigma)}}</math>      ② <math>\frac{15}{\sqrt{(\rho - \sigma)}}</math>      ③ <math>\frac{3}{2\sqrt{(\rho - \sigma)}}</math>      ④ <math>\frac{3}{20\sqrt{(2\rho - \sigma)}}</math></p>                                      |
| 14. | <p>A spherical ball is dropped in a long column of a highly viscous liquid. The curve in the graph shown, which represents the speed of the ball (<math>v</math>) as a function of time (<math>t</math>) is</p>  <p>① A      ② B      ③ C      ④ D</p>   |
| 15. | <p>The rate of cooling at 600 k, at surrounding temperature 300k, is H. the rate of cooling at 900 k is</p> <p>① <math>\frac{16}{3} H</math>      ② 2 H      ③ 3 H      ④ <math>\frac{2}{3} H</math></p>  |
| 16. | <p>Two rods A and B of different materials are welded together as shown in figure. Their thermal conductivities are <math>k_1</math> and <math>k_2</math>. The thermal conductivity of the composite rod will be (they have identical cross sectional area)</p>  <p>① <math>\frac{3(k_1 + k_2)}{2}</math>      ② <math>k_1 + k_2</math>      ③ <math>2(k_1 + k_2)</math>      ④ <math>\frac{k_1 + k_2}{2}</math></p>                                   |
| 17. | <p>Select the correct conversion of P - V cycle into P - T cycle</p>  <p>①       ②       ③       ④ </p> |
| 18. | <p>Molar heat capacity for polytropic process <math>P, V^x = \text{Constant}</math> is</p> <p>① <math>\frac{R}{\gamma-1} + \frac{R}{x-1}</math>      ② <math>\frac{R}{\gamma-1} - \frac{R}{x-1}</math>      ③ <math>\frac{R}{x-1}</math>      ④ <math>\frac{R}{\gamma+1} + \frac{R}{x+1}</math></p>   |

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| 19. | The ideal gas equation for an adiabatic process is<br>① $P \cdot V^\gamma = \text{constant}$ ② $T V^{\gamma+1} = \text{constant}$ ③ $P^{(\gamma-1)} T = \text{constant}$ ④ $P^{\gamma+1} T = \text{constant}$   |
| 20. | One mole of an ideal monoatomic gas at temperature $T_0$ expands slowly according to the law $\frac{P}{V} = \text{constant}$ . If the final temperature is $2 T_0$ , heat supplied to the gas is<br>① $2 R T_0$ ② $R T_0$ ③ $\frac{3}{2} R T_0$ ④ $\frac{1}{2} R T_0$                                       |
| 21. | A particle is executing SHM with amplitude $A$ along $X$ - axis. Initially the particle is at $X = A/2$ , while moving along $+x$ direction . If the equation $x = A \sin(\omega t + \theta)$ then $\theta =$<br>① $\pi$ ② $\frac{\pi}{3}$ ③ $\pi/6$ ④ $0$  |
| 22. | In Doppler effect, when the source moves towards the stationary observer, then<br>① Apparent wavelength $\lambda' = \frac{v_s - u_s}{v_s}$ ② $v_s = n' \lambda'$ $n'$ - apparent frequency<br>③ $v_s = n \lambda$ $n$ - original frequency of source    ④ All the above are correct                         |
| 23. | Gauss's law is true only if force due to a charge varies as<br>① $r^{-1}$ ② $r^{-2}$ ③ $r^{-3}$ ④ $r^{-4}$  |
| 24. | Charges $+q$ , $2q$ , $+3q$ and $4q$ are placed at the corners A, B, C and D of a square as shown in the figure. The direction of electric field at the centre of the square is along<br><br>① AB    ② CB    ③ BD    ④ AC |
| 25. | In the figure a potential of $+1200 \text{ V}$ is given to point A and point B is earthed, what is the potential at the point P.<br><br>① $100 \text{ v}$ ② $200 \text{ v}$ ③ $400 \text{ v}$ ④ $600 \text{ v}$         |
| 26. | The current flowing through resistance $2\Omega$ in the given figure is<br><br>① $1.2 \text{ A}$ ② $0.4 \text{ A}$ ③ $1.4 \text{ A}$ ④ $1.0 \text{ A}$  |

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| 27. | The current flowing in a coil of resistance 90 ohm is to be reduced by 90% . What of resistance should be connected in parallel with it ?<br>① 9 ohm                      ② 90 ohm                      ③ 1000 ohm                      ④ 10 ohm   |
| 28. | For what value of unknown resistance X, the potential difference between B and D will be zero in the circuit shown.<br><br>① 4 Ω                      ② 6 Ω                      ③ 2 Ω                      ④ 5 Ω                            |
| 29. | Three identical resistances A, B and C are connected as shown in the given figure. The heat produced will be maximum.<br><br>① in B                      ② in B and C                      ③ in A                      ④ Same for A, B and C |
| 30. | The binding energy (per nucleon) of nucleus is a measure of its<br>① charge                      ② mass                      ③ momentum                      ④ stability   |
| 31. | The half-life of radium is 1600 years. What is the fraction of sample undelayed after 6400 years.<br>① $\frac{1}{4}$ ② $\frac{1}{8}$ ③ $\frac{1}{16}$ ④ $\frac{1}{21}$   |
| 32. | Planck's constant is dimensionally equal to<br>① linear momentum                      ② Angular momentum                      ③ energy                      ④ work   |
| 33. | If r is the radius of the lowest orbit of Bohr's model of H-atom, the radius of next higher energy orbit is<br>① 4r                      ② 9r                      ③ 16r                      ④ 2r   |
| 34. | Photo-energy 6 eV are incident on a surface of work function 2.1 eV. What is the stopping potential?<br>① -5v                      ② -1.9 v                      ③ -3.9 v                      ④ -8.1 v  |
| 35. | Which of the following is quantised according to Bohr's theory of hydrogen atom ?<br>① linear momentum of electron                      ② Angular momentum of electron<br>③ Linear velocity of electron                      ④ Angular velocity of electron  |

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| 36. | A charged drop is balanced in an electric field of $3 \times 10^4$ v/m. If its mass is $19.75 \times 10^{-16}$ kg, then the charge on the drop is<br>① $2.3 \times 10^{-16}$ c      ② $3.18 \times 10^{-20}$ c      ③ $6.45 \times 10^{-19}$ c      ④ $4.2 \times 10^{-17}$ c |
| 37. | The charge on a hole is equal to<br>① zero      ② proton      ③ neutron      ④ electron   |
| 38. | The p-n junction diode is used as<br>① an amplifier      ② ascillator      ③ rectifier      ④ a modulator   |
| 39. | The phane difference between input and output voltages of a CE circuit is<br>① $0^\circ$ ② $90^\circ$ ③ $180^\circ$ ④ $270^\circ$   |
| 40. | A step down transformer reduces 220 v to 11 v. The primary draws 5A current and secondary supplies 90A. The efficiency of transformer is<br>① 90%      ② 33%      ③ 20%      ④ 4.4%   |

### ■ Assertion Reason based Questions:

**Directions:** Read the following questions and choose any one of the following four responses.

- A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.  
 B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.  
 C: Assertion is correct but Reason is wrong.  
 D: Assertion is wrong but Reason is correct.

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| 41. | <b>Assertion:</b> The flash of lightning is seen before the sound of thunder is heard<br><b>Reason:</b> Speed of sound is greater than speed of light<br>① A      ② B      ③ C      ④ D  |
| 42. | <b>Assertion:</b> The frequencies of incident, reflected and refracted beam of monochromatic light incident from one medium to another are same.<br><b>Reason:</b> The incident, reflected and refracted rays are coplanar<br>① A      ② B      ③ C      ④ D |
| 43. | <b>Assertion:</b> Virtual images are always erect.<br><b>Reason:</b> Virtual images are formed by diverging lenses only<br>① A      ② B      ③ C      ④ D  |
| 44. | <b>Assertion:</b> No interference pattern is observed, when two coherent sources are intinitely close to each other.<br><b>Reason:</b> The fringe width is inversely proportional to the distance between the two slits.<br>① A      ② B      ③ C      ④ D   |
| 45. | <b>Assertion:</b> Radio waves can be polarised.<br><b>Reason:</b> Sound waves in air are longitudinal in naturure.<br>① A      ② B      ③ C      ④ D   |

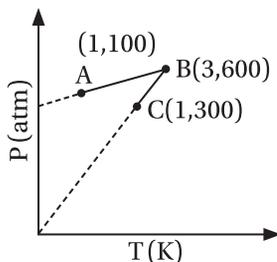
## CHEMISTRY

| 46.      | <p>For the reaction,</p> $A_{(g)} + B_{(g)} \rightleftharpoons C_{(g)} + D_{(g)}$ at 298 K, the values of $\Delta H^\circ$ and $\Delta S^\circ$ are $-29.8 \text{ kcal}$ and $-0.1 \text{ kcal K}^{-1}$ respectively. The values of $\Delta G^\circ$ and equilibrium constant $K_c$ are<br>① 1, 2 respectively    ② 0, 2 respectively    ③ 0, 1 respectively    ④ 0, 0 respectively  |           |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------|--|-----------|-------|-----------|--|----|---|----|------|-----|---|----|-------|------|---|----|------|--|---|----|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.      | <p>For the reaction <math>X_{(g)} + Y_{(g)} \rightleftharpoons 3Z_{(g)}</math> a 3 litre vessel contains 1, 2 and 4 moles of X, Y and Z respectively. Identify the correct statement.</p> ① The reaction will occur in forward direction if $K_c$ for the reaction is 10.<br>② The reaction will occur in backward direction if $K_c$ for the reaction is 15.<br>③ The reaction will be at equilibrium if $K_c$ for the reaction is 10.66.<br>④ All of the above.  |           |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 48.      | <p><math>K_a</math> for formic acid and acetic acid are <math>1.8 \times 10^{-4}</math> and <math>1.8 \times 10^{-5}</math> respectively. The relative strength of acids is<br/>           ① 10 : 1                      ② 1 : 10                      ③ 1 : <math>\sqrt{10}</math>                      ④ <math>\sqrt{10}</math> : 1</p>  |           |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 49.      | <p>What is the % dissociation of <math>H_2S</math>, if 1 mole of <math>H_2S</math> is introduced in one litre vessel at 1000 K? <math>K_c</math> for the reaction,<br/> <math>2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}</math> is <math>1 \times 10^{-6}</math>.<br/>           ① 1.67%                      ② 1.3%                      ③ 1.58%                      ④ 0.01%</p>  |           |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 50.      | <p>The energies <math>E_1</math> and <math>E_2</math> of two radiations are 25 eV and 50 eV respectively. The relation between their wavelengths i.e., <math>\lambda_1</math> and <math>\lambda_2</math> will be<br/>           ① <math>\lambda_1 = \lambda_2</math>                      ② <math>\lambda_1 = 2\lambda_2</math>                      ③ <math>\lambda_1 = 4\lambda_2</math>                      ④ <math>\lambda_1 = \frac{1}{2}\lambda_2</math></p>  |           |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 51.      | <p>Thermodynamic equilibrium constant, K is related to temperature T(K) by equation,<br/> <math display="block">\log_{10} K = -\frac{2303}{T} + 4.06</math>           for <math>MnO_4^- + 8H^+ + 5Fe^{2+} \longrightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O</math><br/>           Match the thermodynamic parameters given in column I with respective values given in column II and choose the correct option.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2">Column I</th> <th colspan="2">Column II</th> </tr> </thead> <tbody> <tr> <td style="width: 20px;">I.</td> <td style="width: 100px;"><math>\Delta S^\circ</math> (in <math>\text{kJ mol}^{-1} \text{K}^{-1}</math>)</td> <td style="width: 20px;">P.</td> <td style="width: 50px;">20.7</td> </tr> <tr> <td>II.</td> <td><math>\Delta H^\circ</math> (in <math>\text{kJ mol}^{-1}</math>)</td> <td>Q.</td> <td>0.078</td> </tr> <tr> <td>III.</td> <td><math>\Delta G^\circ</math> (in <math>\text{kJ mol}^{-1}</math> at 300 K)</td> <td>R.</td> <td>44.1</td> </tr> </tbody> </table><br><table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <tbody> <tr> <td style="width: 20px;"></td> <td style="width: 20px;">I</td> <td style="width: 20px;">II</td> <td style="width: 20px;">III</td> </tr> <tr> <td>①</td> <td>P</td> <td>R</td> <td>Q</td> </tr> <tr> <td>②</td> <td>R</td> <td>P</td> <td>Q</td> </tr> <tr> <td>③</td> <td>Q</td> <td>R</td> <td>P</td> </tr> <tr> <td>④</td> <td>P</td> <td>Q</td> <td>R</td> </tr> </tbody> </table> | Column I  |       | Column II |  | I. | $\Delta S^\circ$ (in $\text{kJ mol}^{-1} \text{K}^{-1}$ ) | P. | 20.7 | II. | $\Delta H^\circ$ (in $\text{kJ mol}^{-1}$ ) | Q. | 0.078 | III. | $\Delta G^\circ$ (in $\text{kJ mol}^{-1}$ at 300 K) | R. | 44.1 |  | I | II | III | ① | P | R | Q | ② | R | P | Q | ③ | Q | R | P | ④ | P | Q | R |
| Column I |  | Column II |       |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| I.       | $\Delta S^\circ$ (in $\text{kJ mol}^{-1} \text{K}^{-1}$ )  | P.        | 20.7  |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| II.      | $\Delta H^\circ$ (in $\text{kJ mol}^{-1}$ )  | Q.        | 0.078 |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| III.     | $\Delta G^\circ$ (in $\text{kJ mol}^{-1}$ at 300 K)  | R.        | 44.1  |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|          | I  | II        | III   |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ①        | P  | R         | Q     |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ②        | R  | P         | Q     |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ③        | Q  | R         | P     |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ④        | P  | Q         | R     |           |  |    |   |    |      |     |   |    |       |      |   |    |      |  |   |    |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

52. The solubility of  $\text{Pb}(\text{OH})_2$  in water is  $6.7 \times 10^{-6} \text{ M}$ . Calculate the solubility of  $\text{Pb}(\text{OH})_2$  in a buffer solution of  $\text{pH} = 8$

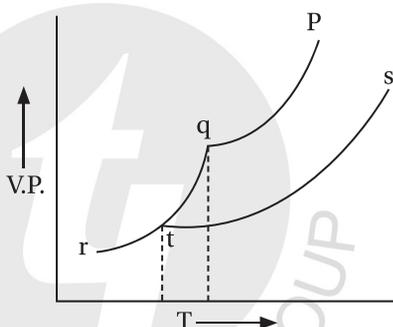
- ①  $1.203 \times 10^{-3} \text{ M}$     ②  $1.421 \times 10^{-3} \text{ M}$     ③  $2.2 \times 10^{-5} \text{ M}$     ④  $10^{-7} \text{ M}$

53. One mole of an ideal gas is subjected to a two step reversible process (A-B and B-C). The pressure at A and C is same. Mark the correct statement.



- ① Work involved in the path AB is zero    ② Volume of gas at A = volume of gas at B  
③ Volume of gas at C = 3 × volume of gas at A    ④ Volume of gas at B is 25 litres

54. Consider the following graph:

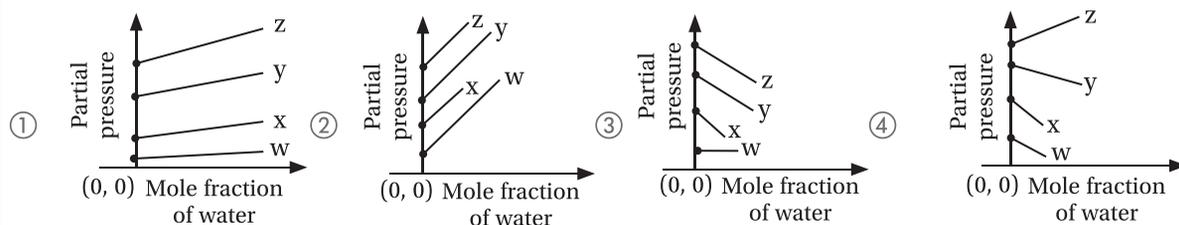


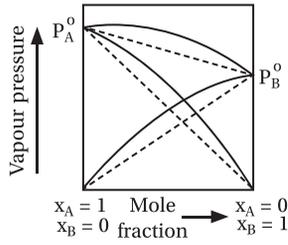
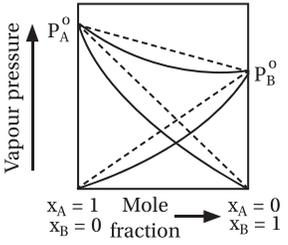
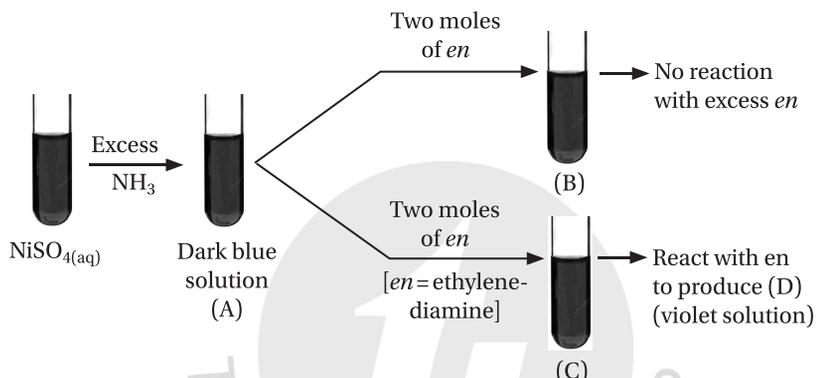
Match the column I with column II and select the correct option.

| Column I<br>(Curve) |    | Column II<br>(Representation) |                          |
|---------------------|----|-------------------------------|--------------------------|
| (A)                 | pq | (P)                           | Solid state of solvent   |
| (B)                 | qr | (Q)                           | Liquid state of solvent  |
| (C)                 | st | (R)                           | Liquid state of solution |

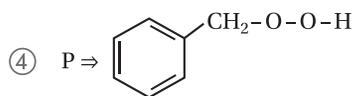
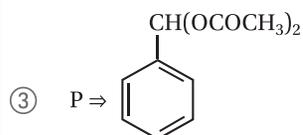
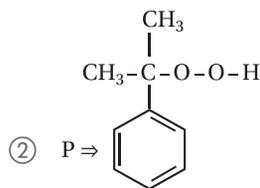
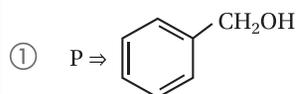
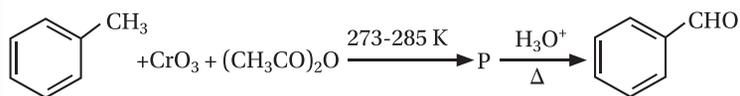
- ① A - P, B - Q, C - R    ② A - Q, B - P, C - R    ③ A - Q, B - R, C - P    ④ A - R, B - Q, C - P

55. For the solution of the gases w, x, y and z in water at 298 K, the Henry's law constants ( $K_H$ ) are 0.5, 2, 35 and 40 kbar, respectively. The correct plot for the given data is



|     |   |
|-----|---|
| 56. | <p>Which condition is fulfilled by solutions showing vapour pressure curve as figure (II)?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(I)</p> </div> <div style="text-align: center;">  <p>(II)</p> </div> </div> <p>① <math>\Delta H_{(\text{mix})} &lt; 0</math>      ② <math>\Delta V_{(\text{mix})} &gt; 0</math>      ③ <math>\Delta H_{(\text{mix})} = 0</math>      ④ None of these</p>   |
| 57. | <p>Identify 'A'. Is it paramagnetic?</p> <div style="text-align: center;">  </div> <p>① A is <math>[\text{Ni}(\text{NH}_3)_6]^{2+}</math>      ② A is paramagnetic<br/>     ③ both ① and ② are correct      ④ only ① is correct</p>  |
| 58. | <p>Using the standard electrode potential, find out the pair between which redox reaction is not feasible.<br/> <math>E^\circ</math> values: <math>\text{Fe}^{3+}/\text{Fe}^{2+} = + 0.77</math>; <math>\text{I}_2/\text{I}^- = + 0.54</math>;<br/> <math>\text{Cu}^{2+}/\text{Cu} = + 0.34</math>; <math>\text{Ag}^+/\text{Ag} = + 0.80\text{V}</math></p> <p>① <math>\text{Fe}^{3+}</math> and <math>\text{I}^-</math>      ② <math>\text{Ag}^+</math> and <math>\text{Cu}</math>      ③ <math>\text{Fe}^{3+}</math> and <math>\text{Cu}</math>      ④ <math>\text{Ag}</math> and <math>\text{Fe}^{3+}</math></p>   |
| 59. | <p>The charge/size ratio of a cation determines its polarizing power. Which one of the following sequences represents the increasing order of the polarizing power of the cationic species, <math>\text{K}^+</math>, <math>\text{Ca}^{2+}</math>, <math>\text{Mg}^{2+}</math>, <math>\text{Be}^{2+}</math>?</p> <p>① <math>\text{Ca}^{2+} &lt; \text{Mg}^{2+} &lt; \text{Be}^{2+} &lt; \text{K}^+</math>      ② <math>\text{Mg}^{2+} &lt; \text{Be}^{2+} &lt; \text{K}^+ &lt; \text{Ca}^{2+}</math><br/>     ③ <math>\text{Be}^{2+} &lt; \text{K}^+ &lt; \text{Ca}^{2+} &lt; \text{Mg}^{2+}</math>      ④ <math>\text{K}^+ &lt; \text{Ca}^{2+} &lt; \text{Mg}^{2+} &lt; \text{Be}^{2+}</math></p> |
| 60. | <p>For the reaction <math>\text{N}_2 + 3\text{H}_2 \longrightarrow 2\text{NH}_3</math>, how are the rate of reaction expressions inter-related <math>\frac{d[\text{H}_2]}{dt}</math> and <math>\frac{d[\text{NH}_3]}{dt}</math>?</p> <p>① <math>-\frac{1}{3} \frac{d[\text{H}_2]}{dt} = +\frac{1}{2} \frac{d[\text{NH}_3]}{dt}</math>      ② <math>-\frac{1}{2} \frac{d[\text{H}_2]}{dt} = +\frac{1}{3} \frac{d[\text{NH}_3]}{dt}</math><br/>     ③ <math>+\frac{1}{2} \frac{d[\text{H}_2]}{dt} = -\frac{1}{3} \frac{d[\text{NH}_3]}{dt}</math>      ④ <math>+\frac{1}{3} \frac{d[\text{H}_2]}{dt} = -\frac{1}{2} \frac{d[\text{NH}_3]}{dt}</math></p>  |

61. In given reaction, 'P' is



62. In carius method of estimation of halogen 0.15 gm of an organic compound gave 0.12 gm of AgBr. Find out the percentage of bromine in the compound.

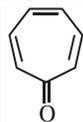
① 23.80%

② 26.03%

③ 29.20%

④ 34.04%

63.



This structure is

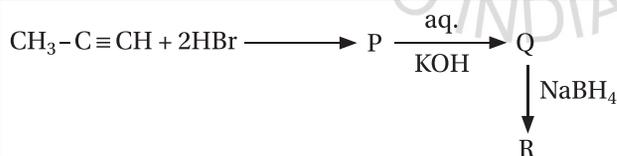
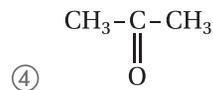
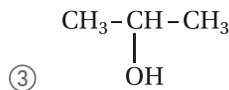
① Alicyclic compound

② Heterocyclic compound

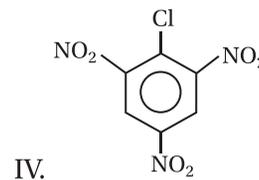
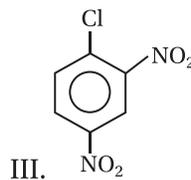
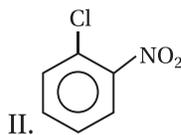
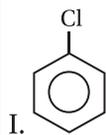
③ Benzenoid aromatic compound

④ Non-Benzenoid compound

64.

①  $\text{CH}_3\text{-CH}_2\text{-CHO}$ ②  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{OH}$ 

65. Correct order of reactivity for nucleophilic substitution reaction of arylhalide.



① I &gt; II &gt; III &gt; IV

② I &lt; II &lt; III &lt; IV

③ I &gt; III &gt; II &gt; IV

④ IV &gt; II &gt; I &gt; III







93. Agar agar is obtained from:
- ① *Chlorella*                      ② *Spirogyra*                      ③ *Ulothrix*                      ④ *Gelidium*
94. Which of the following plant hormones is responsible for apical dominance?
- ① Auxin                      ② Gibberellin                      ③ Cytokinin                      ④ Abscisic acid
95. Which organelle is found in the semi autonomous organelles of a plant cell?
- ① Golgi apparatus                      ② Ribosomes                      ③ Mitochondria                      ④ Endoplasmic reticulum
96. The enzyme responsible for nitrogen fixation in leguminous plants is:
- ① Nitrogenase                      ② Nitrate reductase                      ③ Nitrite reductase                      ④ Rubisco
97. The process of photorespiration occurs in:
- ① C<sub>3</sub> plants only                      ② C<sub>4</sub> plants only                      ③ CAM plants only                      ④ Both C<sub>3</sub> and C<sub>4</sub> plants
98. X chromosome of female, in case of sex linked inheritance, can be passed on to \_\_\_\_\_ .
- ① only female progeny                      ② \_\_\_\_\_ only male progeny  
③ only in granddaughter                      ④ male and female progeny
99. A couple has 6 children, 5 are girls and 1 is boy. The percentage of having a girl the next time is:
- ① 10                      ② 20                      ③ 50                      ④ 100
100. Recapitulation Theory was given by:
- ① Haeckel                      ② Weismann                      ③ Darwin                      ④ Lamarck
101. The pigment responsible for the red color of tomatoes is:
- ① Chlorophyll                      ② Carotenoid                      ③ Anthocyanin                      ④ Lycopene
102. Enzymes often have additional parts in their structure that are made of molecules other than proteins. When this additional chemical part is an organic molecule, it is called:
- ① cofactor                      ② coenzyme                      ③ both a and b                      ④ substrate
103. The ovule of an angiosperm is technically equivalent to :
- ① megasporangium                      ② megasporophyll                      ③ megaspore mother cell                      ④ megaspore
104. The type of pollination that occurs with the help of wind is called:
- ① Hydrophily                      ② Zoophily                      ③ Anemophily                      ④ Entomophily

### Assertion-Reason type Questions:

**Direction :** A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- a. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).  
b. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).  
c. Assertion (A) is true but reason (R) is false.  
d. Assertion (A) is false but reason (R) is true.

105. **Assertion :** Endosperm is a structure containing three complete sets of chromosomes.



115. For yielding one molecule of glucose, the Calvin cycle turns

- ① two times                      ② four times                      ③ six times                      ④ eight times

116. The first national park of India is:

- ① Kanha National Park                      ② Jim Corbett National Park  
③ Kaziranga National Park                      ④ Satpura National Park

117. The type of fruit that develops from a single flower with multiple ovaries is called:

- ① Simple fruit                      ② Aggregate fruit                      ③ Multiple fruit                      ④ Accessory fruit

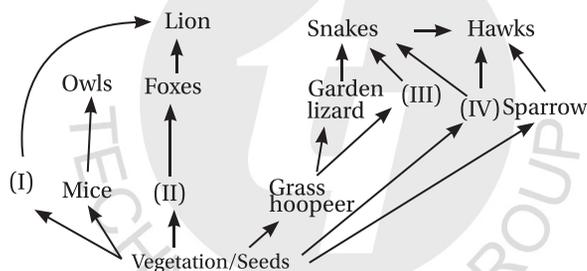
118. Which one of the following pairs of organisms are exotic species introduced in India?

- ① *Ficus religiosa*, *Lantana camara*                      ② *Lantana camara*, water hyacinth  
③ Water hyacinth, *Prosopis cineraria*                      ④ *Nile perch*, *Ficus religiosa*

119. In India, we find mangoes with different flavours, colours, fibre content and shelf life. The large variation can be accounted to:

- ① genetic diversity                      ② species diversity                      ③ induced mutation                      ④ hybridization

120. Identify the likely organisms I, II, III and IV in the food web shown below



- |   | I        | II       | III      | IV     |
|---|----------|----------|----------|--------|
| ① | Deer     | Rabbit   | Frog     | Rat    |
| ② | Dog      | Squirrel | Bat      | Deer   |
| ③ | Rat      | Dog      | Tortoise | Cow    |
| ④ | Squirrel | Cat      | Rat      | Pigeon |

121. The arrangement of flowers on the floral axis is called:

- ① Venation                      ② Phyllotaxy  
③ Inflorescence                      ④ Aestivation

122. The asexual development of seed or embryo without fertilization is called:

- ① Epigeal germination                      ② Hypogeal germination  
③ Vivipary                      ④ Apomixis

123. The process of seed dispersal by wind is called:

- ① Hydrochory                      ② Zoochory  
③ Anemochory                      ④ Autochory

124. Match the following Columns :

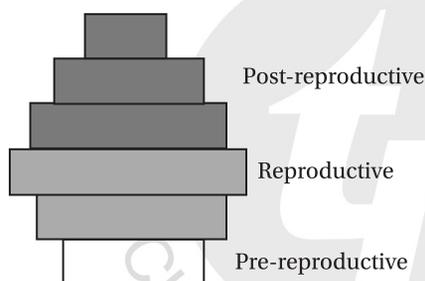
|    | Column I         |    | Column II   |
|----|------------------|----|---|
| A. | Competition      | 1. | Favourable relationship between two species, but not obligatory |
| B. | Antagonism       | 2. | Relationship between two organisms in which both are benefitted |
| C. | Mutualism        | 3. | Harmful coaction between two species                            |
| D. | Protocooperation | 4. | Rivalry between two or more organisms for same resource         |

- A B C D      A B C D      A B C D      A B C D
- ① 1 2 3 4    ② 4 3 2 1    ③ 4 2 1 3    ④ 1 2 4 3

125. Edaphic factors are related to:

- ① humidity                  ② rainfall                  ③ wind velocity                  ④ soil texture

126. What type of human population is represented by the following age pyramid ?



- ① Stable population                  ② Declining population  
③ Expanding population                  ④ Vanishing population

127. If the leaf fall is observed in response to the length of the day/night period, the plants are exhibiting:

- ① Circadian rhythm    ② Phototropism                  ③ Photoperiodism                  ④ Nyctinasty

128. Plants with specialized root structures in marshy areas are adapted to:

- ① Water stress                  ② Anaerobic conditions  
③ High salt concentration                  ④ Low nutrient availability

129. Leaf fall is generally mediated by an increase in which plant hormone?

- ① Auxin                  ② Gibberellin                  ③ Absciscic Acid                  ④ Cytokinin

130. If a long-day plant is exposed to short-day conditions, what will likely be the impact on flowering?

- ① It will flower earlier                  ② It will not flower  
③ It will produce more flowers                  ④ It will produce flowers of a different colour.

131. This pedigree is of a rare trait, in which children have extra fingers and toes. Which one of the following patterns of inheritance is consistent with this pedigree?





144. Identify the CORRECT match of the following endocrine glands with their respective hormones:

|       | Endocrine gland |     | Hormone        |
|-------|-----------------|-----|----------------|
| (i)   | Pituitary gland | (A) | Insulin        |
| (ii)  | Thyroid gland   | (B) | Growth hormone |
| (iii) | Pancreas        | (C) | Thyroxine      |
| (iv)  | Adrenal gland   | (D) | Adrenaline     |

- ① (i)-(B), (ii)-(C), (iii)-(A), (iv)-(D)                      ② (i)-(D), (ii)-(B), (iii)-(C), (iv)-(A)  
 ③ (i)-(A), (ii)-(C), (iii)-(B), (iv)-(D)                      ④ (i)-(C), (ii)-(A), (iii)-(D), (iv)-(B)

145. Which of the following is NOT a component of the human skeletal system ?

- ① Bones                      ② Cartilages                      ③ Ligaments                      ④ Muscles

146. Identify the CORRECT statement regarding the sliding filament theory of muscle contraction:

- ① Actin filaments slide over myosin filaments, shortening the sarcomere  
 ② Myosin filaments slide over actin filaments, shortening the sarcomere.  
 ③ Both actin and myosin filaments shorten, leading to muscle contraction  
 ④ Calcium ions are not involved in muscle contraction.

147. The time gap between an infection and its appearance is called \_\_\_\_\_ .

- ① response period    ② incubation period    ③ latent period                      ④ stimulation period

148. Which of the following cells is responsible for producing antibodies?

- ① T lymphocytes    ② B lymphocytes    ③ Macrophages                      ④ Neutrophils

149. Which of the following is a feature of malignant tumour?

- ① Invasiveness                      ② Metastasis  
 ③ It carries dedifferentiated cells                      ④ All of the above

150. Infection of *Ascaris* usually occurs by-

- ① eating imperfectly cooked pork                      ② tse tse fly  
 ③ mosquito bite                      ④ All of the above

151. Which of the following contraceptive methods provides protection against sexually transmitted diseases?

- ① Oral contraceptive pills                      ② Intrauterine devices  
 ③ Condoms                      ④ Vasectomy

152. Which of the following is NOT a method of assisted reproductive technology (ART)?

- ① In vitro fertilization (IVF)                      ② Intrauterine insemination  
 ③ Surrogacy                      ④ Tubectomy

153. Which of the following statements is CORRECT regarding human evolution?

- ① Humans evolved from chimpanzees.

② Humans and chimpanzees share a common ancestor.

③ Humans are the only surviving hominid species

④ Human evolution has stopped.

154. Which of the following is NOT a characteristic of all mammals?

① Mammary glands    ② Muscular diaphragm    ③ Viviparity    ④ Warm-bloodedness

155. Identify the CORRECT match of the following animal phyla with their characteristic features:

|       | Phylum        |     | Characteristic Feature |
|-------|---------------|-----|------------------------|
| (i)   | Porifera      | (A) | Jointed appendages     |
| (ii)  | Cnidaria      | (B) | Water vascular system  |
| (iii) | Arthropoda    | (C) | Nematocysts            |
| (iv)  | Echinodermata | (D) | Pores for water flow   |

① (i)-(D), (ii)-(C), (iii)-(A), (iv)-(B)

② (i)-(D), (ii)-(B), (iii)-(C), (iv)-(A)

③ (i)-(A), (ii)-(C), (iii)-(B), (iv)-(D)

④ (i)-(C), (ii)-(A), (iii)-(D), (iv)-(B)

156. Which of the following is an example of an invertebrate chordate?

① Lamprey

② Hagfish

③ Lancelet

④ Shark

157. Name the sound producing organ found in birds.

① Larynx

② Talon

③ Pharynx

④ Syrinx

158. Which of the following is an example of a cartilaginous fish?

① Tuna

② Salmon

③ Shark

④ Catfish

159. Thymosin is secreted by

① thyroid gland

② parathyroid gland

③ thymus gland

④ hypothalamus

160. Which of the following crosses will give recessive progeny in the F1 generation?

① TT X tt

② tt X tt

③ TT X Tt

④ Tt X Tt

### Assertion-Reason type Questions:

**Direction :** A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

a. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

b. Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).

c. Assertion (A) is true but reason (R) is false.

d. Assertion (A) is false but reason (R) is true.

161. **Assertion :** Test cross is used to determine an unknown genotype within one breeding generation.

**Reason :** Test cross is a cross between F1 hybrid and the dominant parent.

① a

② b

③ c

④ d

162. The loss of chromosomal segment is due to:

① deletions

② duplication

③ polyploidy

④ inversions



**Assertion-Reason type Questions:**

**Direction :** A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

175. **Assertion :** Inbreeding is the reproduction between closely related organisms.

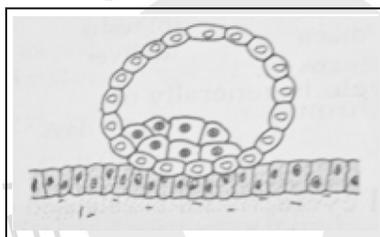
**Reason :** Intensive inbreeding reduces the variability of the genome.

- ① a                      ② b                      ③ c                      ④ d

176. PID stands for:

- Portal Inflammatory Disease
- Pelvic Inflammatory Disease
- Postural Inflammatory Disease
- Pubic Inflammatory Disease

177. Study and identify the given structure represents



- morula
- zygote
- blastocyst
- gastrula

178. Match the following ovular structure with post-fertilisation structure and select the correct alternative.

|    | Column-I     |    | Column-II |
|----|--------------|----|-----------|
| A. | Ovule        | 1. | Endosperm |
| B. | Funiculus    | 2. | Aril      |
| C. | Nucellus     | 3. | Seed      |
| D. | Polar nuclei | 4. | Perisperm |

- ① A B C D    ② A B C D    ③ A B C D    ④ A B C D  
 2 3 4 1      2 3 1 4      3 2 4 1      3 2 1 4

179. Select the non nitrogenous waste.

- creatinine
- hippuric acid
- allantoin
- citrulline

180. The volume of blood that enters into the aorta with each ventricular systole is called

- vital capacity
- cardiac output
- stroke volume
- blood pressure