

1 - 3-NEET-11-P-HS00

Q1. The angle of 1' (minute of arc) in radian is nearly equal to

- | | |
|--------------------------------------|--------------------------------------|
| 1) $1.75 \times 10^{-2} \text{ rad}$ | 2) $2.91 \times 10^{-4} \text{ rad}$ |
| 3) $4.85 \times 10^{-4} \text{ rad}$ | 4) $4.80 \times 10^{-6} \text{ rad}$ |

Q2. In an experiment, four quantities a, b, c and d are measured with percentage error 1%, 2%, 3% and 4%, respectively. Quantity P is calculated as follows:

$$P = \frac{a^3 b^2}{cd}, \text{ \% error in P is}$$

- | | |
|--------|--------|
| 1) 14% | 2) 10% |
| 3) 7% | 4) 4% |

Q3. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level.

If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is [2018]

- | | |
|-------------|-------------|
| 1) 0.529 cm | 2) 0.521 cm |
| 3) 0.053 cm | 4) 0.525 cm |

Q4.

In an experiment, the percentage of error occurred in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4%, respectively. The maximum percentage of error in the measurement

X, where $X = \frac{A^2 B^{1/2}}{C^{1/3} D^3}$, will be [2019]

- | | |
|--------|----------------------------------|
| 1) 10% | 2) $\left(\frac{3}{13}\right)\%$ |
| 3) 16% | 4) -10% |

Q5. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale. The pitch of the screw gauge is [2020]

- | | |
|------------|------------|
| 1) 1.0 mm | 2) 0.01 mm |
| 3) 0.25 mm | 4) 0.5 mm |

Q6. Time intervals measured by a clock give the following readings: 1.25 s, 1.24 s, 1.27 s, 1.21 s and 1.28 s

What is the percentage relative error of the observations?

- | | |
|---------|--------|
| 1) 1.6% | 2) 2% |
| 3) 4% | 4) 16% |

Q7. A vehicle travels half the distance with speed v and the remaining distance with speed $2v$. Its average speed is [2023]

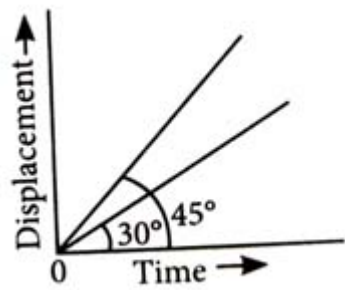
1) $\frac{4v}{3}$

3) $\frac{v}{3}$

2) $\frac{3v}{4}$

4) $\frac{2v}{3}$

Q8. The displacement-time graphs of two moving particles make angles of 30° and 45° with the x -axis as shown in the figure. The ratio of their respective velocity is [2022]



1) $\sqrt{3}:1$

3) $1:2$

2) $1:1$

4) $1:\sqrt{3}$

Q9. Two cars P and Q start from a point at the same time in a straight line and their positions are represented by $x_P(t) = (at + bt^2)$ and $x_Q(t) = (ft - t^2)$. At what time do the cars have the same velocity? [2016]

1) $\frac{a-f}{1+b}$

3) $\frac{a+f}{2(1+b)}$

2) $\frac{a+f}{2(b-1)}$

4) $\frac{f-a}{2(1+b)}$

Q10. If the velocity of a particle is $v = At + Bt^2$, where A and B are constants, then the distance travelled by it between 1 s and 2 s is: [2016]

1) $\frac{3}{2}A + \frac{7}{3}B$

3) $\frac{3}{2}A + 4B$

2) $\frac{A}{2} + \frac{B}{3}$

4) $3A + 7B$

Q11. In some appropriate units, time (t) and position (x) relation of a moving particle is given by $t = x^2 + x$. The acceleration of the particle is: [2025]

1) $+\frac{2}{(x+1)^3}$

3) $-\frac{2}{(x+2)^3}$

2) $+\frac{2}{2x+1}$

4) $-\frac{2}{(2x+1)^3}$

Q12. A particle is moving along x -axis with its position (x) varying with time (t) as $x = \alpha t^4 + \beta t^2 + \gamma t + \delta$. The ratio of its initial acceleration, respectively, is [2024]

1) $2\alpha:\delta$

3) $4\alpha:\beta$

2) $\gamma:2\delta$

4) $\gamma:2\beta$

Q13. If the magnitude of sum of two vectors is equal to the magnitude of difference of the two vectors, the angle between these vectors is [2016]

1) 45°

3) 0°

2) 180°

4) 90°

Q14. The two dimensional motion of a particle, described by $\vec{r} = (\hat{i} + 2\hat{j})A\cos\omega t$ is a/an

- A. parabolic path
- B. elliptical path
- C. periodic path
- D. simple harmonic motion

Choose the correct answer from the options given below:

[2024]

- 1) B, C and D only
- 2) A, B and C only
- 3) A, C and D only
- 4) C and D only

Q15. The position of a particle is given by $\vec{r}(t) = 4t \hat{i} + 2t^2 \hat{j} + 5 \hat{k}$

where t is in seconds and r in metre. Find the magnitude and direction of velocity $v(t)$, at $t = 1s$, with respect to the x -axis. [2023]

- 1) $4\sqrt{2} \text{ ms}^{-1}$, 45°
- 2) $4\sqrt{2} \text{ ms}^{-1}$, 60°
- 3) $3\sqrt{2} \text{ ms}^{-1}$, 30°
- 4) $3\sqrt{2} \text{ ms}^{-1}$, 45°

Q16. The x and y coordinates of the particle at any time are $x = 5t - 2t^2$ and $y = 10t$ respectively, where x and y are in metres and t in seconds. The acceleration of the particle at $t = 2 \text{ s}$ is [2017]

- 1) 5ms^{-2}
- 2) -4ms^{-2}
- 3) -8ms^{-2}
- 4) 0

Q17. The position vector of a particle $\vec{R}$ as a function of time is given by $\vec{R} = 4\sin(2\pi t)\hat{i} + 4\cos(2\pi t)\hat{j}$ where R is in meters, t is in seconds and $\hat{i}$ and $\hat{j}$ denote unit vectors along x and y -directions, respectively. Which one of the following statements is wrong for the motion of the particle? [2015]

- 1) Magnitude of the velocity of particle is 8 meter/second.
- 2) Path of the particle is a circle of radius 4 meter.
- 3) Acceleration vector is along $-\vec{R}$.
- 4) Magnitude of acceleration vector is $\frac{v^2}{R}$, where v is the velocity of particle.

Q18. A particle is moving such that its position coordinates (x, y) are (2 m, 3 m) at time $t = 0$, (6 m, 7 m) at time $t = 2 \text{ s}$ and (13 m, 14 m) at time $t = 5 \text{ s}$. Average velocity vector $(\vec{v}_{av})$ from $t = 0$ to $t = 5 \text{ s}$ is [2014]

- 1) $\frac{1}{5}(13\hat{i} + 14\hat{j})$
- 2) $\frac{7}{3}(\hat{i} + \hat{j})$
- 3) $2(\hat{i} + \hat{j})$
- 4) $\frac{11}{5}(\hat{i} + \hat{j})$

Q19. A ball of mass 0.5 kg is dropped from a height of 40 m. The ball hits the ground and rises to a height of 10 m. The impulse imparted to the ball during its collision with the ground is (Take $g = 9.8\text{m/s}^2$) [2025]

1) 0

2) 84 NS

3) 21 NS

4) 7 NS

Q20. A 1 kg object strikes a wall with velocity 1ms^{-1} at an angle of 60° with the wall and reflects at the same angle. If it remains in contact with the wall for 0.1 s, then the force exerted on the wall is [2023]

1) $30\sqrt{3}\text{N}$

2) Zero

3) $10\sqrt{3}\text{N}$

4) $20\sqrt{3}\text{N}$

Q21. A football player is moving southward and suddenly turns eastward with the same speed to avoid an opponent. The force that acts on the player while turning is [2023]

1) along north-east

2) along south-west

3) along eastward

4) along northward

Q22. A bullet from a gun fired on a rectangular wooden block with velocity u . When bullet travels 24 cm through the block along its length horizontally, velocity of bullet becomes $\frac{u}{3}$. Then it further penetrates into the block in the same direction before coming to rest exactly at the other end of the block. The total length of the block is [2023]

1) 28 cm

2) 30 cm

3) 27 cm

4) 24 cm

Q23. A ball of mass 0.15 kg is dropped from a height 10 m, strikes the ground and rebounds to the same height. The magnitude of impulse imparted to the ball is ($g = 10\text{m/s}^2$) nearly [2021]

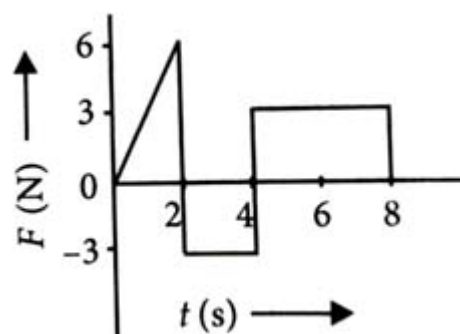
1) 1.4 kg m/s

2) 0 kg m/s

3) 4.2 kg m/s

4) 2.1 kg m/s

Q24. The force F acting on a particle of mass m is indicated by the force-time graph as shown. The change in momentum of the particle over the time interval from zero to 8 s is [2014]



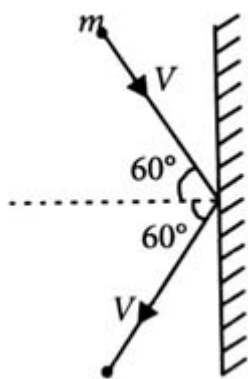
1) 24 N s

2) 20 N s

3) 12 N s

4) 6 N s

Q25. A rigid ball of mass m strikes a rigid wall at 60° and gets reflected without loss of speed as shown in the figure. The value of impulse imparted by the wall on the ball will be [2016]



- | | |
|-------------------|-------------------|
| 1) mV | 2) $2mV$ |
| 3) $\frac{mV}{2}$ | 4) $\frac{mV}{3}$ |

Q26. A particle moves so that its position vector is given by $\vec{r} = \cos\omega t \hat{x} + \sin\omega t \hat{y}$, where ω is a constant. Which of the following is true? **[2016]**

- 1) Velocity is perpendicular to $\vec{r}$ and acceleration is directed towards the origin.
- 2) Velocity is perpendicular to $\vec{r}$ and acceleration is directed away from the origin.
- 3) Velocity and acceleration both are perpendicular to $\vec{r}$.
- 4) Velocity and acceleration both are parallel to $\vec{r}$.

Q27. If vectors $\vec{A} = \cos\omega t \hat{i} + \sin\omega t \hat{j}$ and $\vec{B} = \cos\frac{\omega t}{2} \hat{i} + \sin\frac{\omega t}{2} \hat{j}$ are functions of time, then the value of t at which they are orthogonal to each other is **[2015]**

- | | |
|------------------------------|------------------------------|
| 1) $t = \frac{\pi}{\omega}$ | 2) $t = 0$ |
| 3) $t = \frac{\pi}{4\omega}$ | 4) $t = \frac{\pi}{2\omega}$ |

Q28. 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 **[2025]**

- | | |
|------------------|------------------|
| 1) $\frac{1}{3}$ | 2) $\frac{1}{2}$ |
| 3) $\frac{3}{2}$ | 4) $\frac{2}{3}$ |

Q29. An object moving along horizontal x -direction with kinetic energy 10 J is displaced through $\vec{x} = (3\hat{i})$ m, by the force $\vec{F} = (-2\hat{i} + 3\hat{j})$ N. The kinetic energy of the object at the end of the displacement x is: **[2024]**

- | | |
|---------|---------|
| 1) 10 J | 2) 16 J |
| 3) 4 J | 4) 6 J |

Q30. Consider a drop of rain water having mass 1 g falling from a height of 1 km. It hits the ground with a speed of 50 ms^{-1} . Take g constant with a value 10 ms^{-2} . The work done by the (i) gravitational force and the (ii) resistive force of air is **[2017]**

- | | | | |
|---------------|---------------|--------------|---------------|
| 1) (i) 1.25 J | (ii) - 8.25 J | 2) (i) 100 J | (ii) 8.75 J |
| 3) (i) 10J | (ii) - 8.75 J | 4) (i) - 10J | (ii) - 8.25 J |

Q31. A particle of mass 10 g moves along a circle of radius 6.4 cm with a constant tangential acceleration. What is the magnitude of this acceleration if the kinetic energy of the particle becomes equal to $8 \times 10^{-4} \text{ J}$ by the end of the second revolution after the beginning of the motion? [2016]

- | | |
|-------------------------|-------------------------|
| 1) 0.18 m/s^2 | 2) 0.2 m/s^2 |
| 3) 0.1 m/s^2 | 4) 0.15 m/s^2 |

Q32. A particle moves from a point $(-2\hat{i} + 5\hat{j})$ to $(4\hat{j} + 3\hat{k})$ when a force of $(4\hat{i} + 3\hat{j})$ N is applied. How much work has been done by the force? [2016]

- | | |
|--------|---------|
| 1) 8 J | 2) 11 J |
| 3) 5 J | 4) 2 J |

Q33. Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass. The distance of the center of mass of the system from the 10 kg mass is [2022]

- | | |
|-----------------------------|-----------------------------|
| 1) $\frac{10}{3} \text{ m}$ | 2) $\frac{20}{3} \text{ m}$ |
| 3) 10 m | 4) 5 m |

Q34. Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass. The centre of mass of the system from the 5 kg particle is nearly at a distance of [2020]

- | | |
|----------|----------|
| 1) 33 cm | 2) 50 cm |
| 3) 67 cm | 4) 80 cm |

Q35. Let ω_1, ω_2 and ω_3 be the angular speed of the second hand, minute hand and hour hand of a smoothly running analog clock, respectively. If x_1, x_2 and x_3 are their respective angular distances in 1 minute then the factor which remains constant (k) is: [2024]

- | | |
|---|---|
| 1) $\frac{\omega_1}{x_1} = \frac{\omega_2}{x_2} = \frac{\omega_3}{x_3} = k$ | 2) $\omega_1 x_1 = \omega_2 x_2 = \omega_3 x_3 = k$ |
| 3) $\omega_1 x_1^2 = \omega_2 x_2^2 = \omega_3 x_3^2 = k$ | 4) $\omega_1^2 x_1 = \omega_2^2 x_2 = \omega_3^2 x_3 = k$ |

Q36. The angular acceleration of a body, moving along the circumference of a circle, is [2023]

- | | |
|---------------------------------------|---|
| 1) along the tangent to its position | 2) along the axis of rotation |
| 3) along the radius, away from centre | 4) along the radius towards the centre. |

Q37. Find the torque about the origin when a force of $3\hat{j} \text{ N}$ acts on a particle whose position vector is $2\hat{k} \text{ m}$. [2020]

- | | |
|---------------------------|--------------------------|
| 1) $6\hat{i} \text{ Nm}$ | 2) $6\hat{j} \text{ Nm}$ |
| 3) $-6\hat{i} \text{ Nm}$ | 4) $6\hat{k} \text{ Nm}$ |

Q38. The moment of the force, $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at $(2, 0, -3)$ about the point $(2, -2, -2)$, is given by **[2018]**

- | | |
|--------------------------------------|--------------------------------------|
| 1) $-8\hat{i} - 4\hat{j} - 7\hat{k}$ | 2) $-4\hat{i} - \hat{j} - 8\hat{k}$ |
| 3) $-7\hat{i} - 8\hat{j} - 4\hat{k}$ | 4) $-7\hat{i} - 4\hat{j} - 8\hat{k}$ |

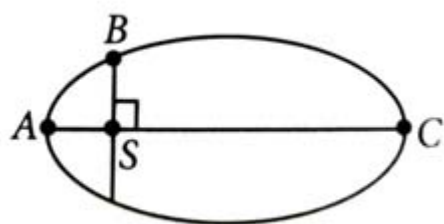
Q39. A force $\vec{F} = \alpha\hat{i} + 3\hat{j} + 6\hat{k}$ is acting at a point $\vec{r} = 2\hat{i} - 6\hat{j} - 12\hat{k}$. The value of α for which angular momentum about origin is conserved is **[2015]**

- | | |
|---------|------|
| 1) zero | 2) 1 |
| 3) -1 | 4) 2 |

Q40. The radius of Martian orbit around the Sun is about 4 times the radius of the orbit of Mercury. The Martian year is 687 Earth days. Then which of the following is the length of 1 year on Mercury? **[2025]**

- | | |
|-------------------|-------------------|
| 1) 172 earth days | 2) 124 earth days |
| 3) 88 earth days | 4) 225 earth days |

Q41. The kinetic energies of a planet in an elliptical orbit about the Sun, at positions A, B and C are K_A , K_B and K_C , respectively. AC is the major axis and SB is perpendicular to AC at the position of the Sun S as shown in the figure. Then **[2018]**



- | | |
|----------------------|----------------------|
| 1) $K_A < K_B < K_C$ | 2) $K_A > K_B > K_C$ |
| 3) $K_B < K_A < K_C$ | 4) $K_B > K_A > K_C$ |

Q42. A body of mass 60 g experiences a gravitational force of 3.0 N, when placed at a particular point. The magnitude of the gravitational field intensity at that point is **[2022]**

- | | |
|--------------|-------------|
| 1) 0.05 N/kg | 2) 50 N/kg |
| 3) 20 N/kg | 4) 180 N/kg |

Q43. Two astronauts are floating in gravitational free space after having lost contact with their spaceship. The two will **[2017]**

- | | |
|----------------------------|---|
| 1) move towards each other | 2) move away from each other |
| 3) will become stationary | 4) keep floating at the same distance between them. |

Q44. Kepler's third law states that square of period of revolution (T) of a planet around the sun is proportional to the third power of average distance r between sun and planet, i.e., $T^2 = Kr^3$ here K is a constant. If the masses of the sun and planet are M and m respectively, then as per Newton's law of gravitation, the force of attraction between them is $F = \frac{GMm}{r^2}$, here G is the gravitational constant. The relation between G and K is described as **[2015]**

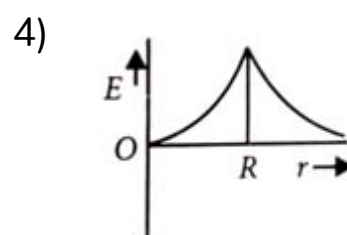
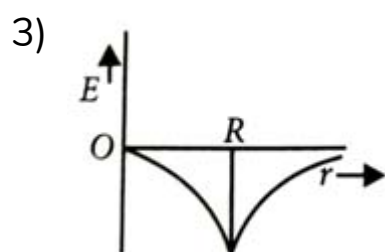
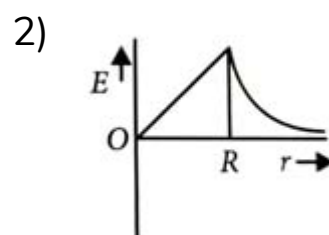
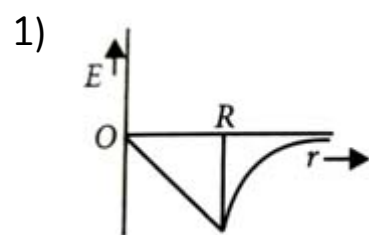
1) $K = G$

2) $K = \frac{1}{G}$

3) $GK = 4\pi^2$

4) $GMK = 4\pi^2$

Q45. Dependence of intensity of gravitational field (E) of earth with distance (r) from centre of earth is correctly represented by [2014]



2 - 3-NEET-11-C-HS00

Q46. The Elements X, Y Combine to Form Two Compounds as XY and X₂Y. Find the Atomic Weight of X and Y, When the Weight of 0.1 Moles of XY is 10g and 0.05 Moles of X₂Y is 9g.

1) 60, 40

2) 80, 20

3) 30, 20

4) 20, 30

Q47. Which of the Following one has the Largest Number of Atoms?

1) 0.5 g atoms of Cu

2) 0.635 g Cu

3) 0.25 moles of Cu atoms

4) 1g of Cu

Q48. How Many ml of Water Must be Added to 200 ml of .65 M HCl to Further Dilute the Solution to 0.20 M?

1) (a) 450 ml

2) (b) 750 ml

3) (c) 550 ml

4) (d) 500 ml

Q49. The Mass of 2.044×10^{23} Carbon Atoms is Given by_____

1) 15 g

2) 38 g

3) 24 g

4) 48 g

Q50. If the Density of Oxygen (O₂) gas at NTP is 1.429g/L, Calculate the Standard Molar Volume of the Oxygen Gas.

1) 22.39 Litres

2) 25 Litres

3) 21.2 Litres

4) None of the above

Q51. Boron exists as two stable isotopes; ¹⁰B(19%) and ¹¹B(81%). Find out the average atomic weight of boron in the periodic table

1) 10.0

2) 11.2

3) 10.2

4) 10.8

Q52. Dalton's atomic theory could not explain which of the following? [2025]

1) Law of multiple proportion

2) Law of gaseous volume

3) Law of conservation of mass

4) Law of constant proportion

Q53. What is the mass of the precipitate formed when 50 mL of 16.9% solution of AgNO_3 is mixed with 50 mL of 5.8% NaCl solution?

($\text{Ag} = 107.8$, $\text{N} = 14$, $\text{O} = 16$, $\text{Na} = 23$, $\text{Cl} = 35.5$)

[2015]

1) 3.5 g

2) 7 g

3) 14 g

4) 28 g

Q54. 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much? (At. wt. $\text{Mg} = 24$, $\text{O} = 16$) [2014]

1) Mg , 0.16 g

2) O_2 , 0.16 g

3) Mg , 0.44 g

4) O_2 , 0.28 g

Q55. Select the correct statements from the following:

A. Atoms of all elements are composed of two fundamental particles.

B. The mass of electron is 9.10939×10^{-31} kg.

C. All the isotopes of a given element show same chemical properties.

D. Protons and electrons are collectively known as nucleons.

E. Dalton's atomic theory, regarded the atom as an ultimate particle of matter.

Choose the correct answer from the options given below:

[2023]

1) A and E only

2) B, C and E only

3) A, B and C only

4) C, D and E only

Q56. From the following pairs of ions which one is not an iso-electronic pair?

[2021]

1) Fe^{2+} , Mn^{2+}

2) O^{2-} , F^-

3) Na^+ , Mg^{2+}

4) Mn^{2+} , Fe^{3+}

Q57. The ratio of the wavelengths of the light absorbed by a hydrogen atom when it undergoes $n = 2 \rightarrow n = 3$ and $n = 4 \rightarrow n = 6$ transitions, respectively, is [2025]

1) $\frac{1}{9}$

2) $\frac{1}{4}$

3) $\frac{1}{36}$

4) $\frac{1}{16}$

Q58. Given below are two statements:

Statement I: The Balmer spectral line for H atom with lowest energy is located at $\frac{5}{36}R_H\text{cm}^{-1}$ (R_H = Rydberg constant).

Statement II: When the temperature of black body increases, the maxima of the curve (intensity of wavelength) shifts to shorter wavelength.

In the light of the above statements choose the correct answer from the options given below.

[2024]

- | | |
|---|---|
| 1) Statement I is true but Statement II is false. | 2) Statement I is false but Statement II is true. |
| 3) Both Statement I and Statement II are true. | 4) Both Statement I and Statement II are false. |

Q59. Which of the following series of transitions in the spectrum of hydrogen atom falls in visible region? [2019]

- | | |
|--------------------|-------------------|
| 1) Brackett series | 2) Lyman series |
| 3) Balmer series | 4) Paschen series |

Q60. Calculate the energy in joule corresponding to light of wavelength 45 nm.

(Planck's constant, $h = 6.63 \times 10^{-34}$ J s, speed of light, $c = 3 \times 10^8$ ms⁻¹)

[2014]

- | | |
|---------------------------|---------------------------|
| 1) 6.67×10^{15} | 2) 6.67×10^{11} |
| 3) 4.42×10^{-15} | 4) 4.42×10^{-18} |

Q61. If radius of second Bohr orbit of the He^+ ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion? [2022]

- | | |
|-------------|-------------|
| 1) 158.7 pm | 2) 15.87 pm |
| 3) 1.587 pm | 4) 158.7 Å |

Q62. The quantum numbers of four electrons are given below.

- I. $n = 4; l = 2; m_l = -2; s = -\frac{1}{2}$
II. $n = 3; l = 2; m_l = 1; s = +\frac{1}{2}$
III. $n = 4; l = 1; m_l = 0; s = +\frac{1}{2}$
IV. $n = 3; l = 1; m_l = -1; s = +\frac{1}{2}$

The correct decreasing order of energy of these electrons is

[2024]

- | | |
|----------------------|----------------------|
| 1) IV > II > III > I | 2) I > III > II > IV |
| 3) III > I > II > IV | 4) I > II > III > IV |

Q63. The relation between n_m , (n_m = the number of permissible values of magnetic quantum number (m)) for a given value of azimuthal quantum number (l), is [2023]

- | | |
|----------------------------|-------------------|
| 1) $n_m = 2l^2 + 1$ | 2) $n_m = l + 2$ |
| 3) $l = \frac{n_m - 1}{2}$ | 4) $l = 2n_m + 1$ |

Q64. The IUPAC name of an element with atomic number 119 is

[2022]

- | | |
|---------------|----------------|
| 1) ununennium | 2) unnilennium |
|---------------|----------------|

3) unununium

4) ununoctium

Q65. Which among the following electronic configurations belong to main group elements?
[2025]

- A. $[Ne]3s^1$
- B. $[Ar]3d^34s^2$
- C. $[Kr]4d^{10}5s^25p^5$
- D. $[Ar]3d^{10}4s^1$
- E. $[Rn]5f^06d^27s^2$

Choose the correct answer from the option given below:

- 1) D and E only
- 2) A, C and D only
- 3) B and E only
- 4) A and C only

Q66. Match List-I with List-II. [2024]

	List-I (Block/ group in periodic table)		List-II (Element)
A.	Lanthanoid	I.	Ce
B.	d-block element	II.	As
C.	p-block element	III.	Cs
D.	s-block element	IV.	Mn

Choose the correct answer from the options given below:

- 1) A – I, B – II, C – IV, D – III
- 2) A – I, B – IV, C – III, D – II
- 3) A – I, B – IV, C – II, D – III
- 4) A – IV, B – I, C – II, D – III

Q67. The correct decreasing order of atomic radii (pm) of Li, Be, B and C is [2024]

- 1) $Be > Li > B > C$
- 2) $Li > Be > B > C$
- 3) $C > B > Be > Li$
- 4) $Li > C > Be > B$

Q68. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R). [2023]

Assertion (A): Lithium and beryllium unlike their other respective group members form compounds with pronounced ionic character.

Reason (R): Lithium and Magnesium have similar properties due to diagonal relationship.

In the light of the above statements, choose the correct answer from the options given below:

- 1) (A) is true but (R) is false.
- 2) (A) is false but (R) is true.
- 3) Both (A) and (R) are true and (R) is the correct explanation of (A).
- 4) Both (A) and (R) are true but (R) is not the correct explanation of (A).

Q69. For the second period elements the correct increasing order of first ionization enthalpy is
[2019]

- | | |
|---|---|
| 1) $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$ | 2) $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$ |
| 3) $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$ | 4) $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$ |

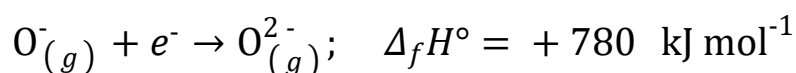
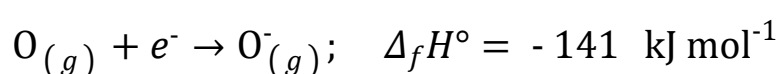
Q70. Match the oxide given in column I with its property given in column II. [2019]

Column I	Column II
(i) Na_2O	A. Neutral
(ii) Al_2O_3	B. Basic
(iii) N_2O	C. Acidic
(iv) Cl_2O_7	D. Amphoteric

Which of the following options has all correct pairs?

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

Q71. The formation of the oxide ion, $\text{O}_{(g)}^{2-}$ from oxygen atom requires first an exothermic and then an endothermic step as shown below:



Thus, process of formation of O^{2-} in gas phase is unfavourable even though O^{2-} is isoelectronic with neon. It is due to the fact that, [2015]

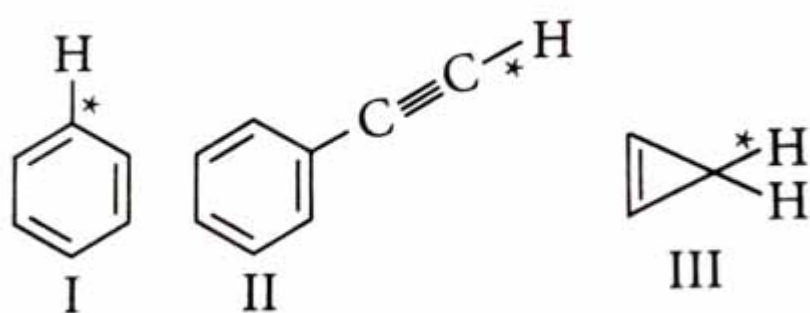
- O^- ion has comparatively smaller size than oxygen atom
- oxygen is more electronegative
- addition of electron in oxygen results in larger size of the ion
- electron repulsion outweighs the stability gained by achieving noble gas configuration.

Q72. Amongst the following, the total number of species not having eight electrons around central atom in its outermost shell, is [2023]



- | | |
|------|------|
| 1) 4 | 2) 1 |
| 3) 3 | 4) 2 |

Q73. Among the given compounds I–III, the correct order of bond dissociation energy of C—H bond marked with * is [2025]



- | | |
|--|--|
| 1) $\text{III} > \text{II} > \text{I}$ | 2) $\text{II} > \text{III} > \text{I}$ |
|--|--|

3) II > I > III

4) I > II > III

Q74. Which of the following molecules has "non zero" dipole moment value? [2024]

1) CCl_4

2) HI

3) CO_2

4) BF_3

Q75. Identify the correct answer. [2024]

1) Three resonance structures can be drawn for ozone. 2) BF_3 has non-zero dipole moment.

3) Dipole moment of NF_3 is greater than that of NH_3 . 4) Three canonical forms can be drawn for CO_3^{2-} ion.

Q76. Which of the following molecules is non-polar in nature? [2021]

1) NO_2

2) POCl_3

3) CH_2O

4) SbCl_5

Q77. The species, having bond angles of 120° is [2017]

1) ClF_3

2) NCl_3

3) BCl_3

4) PH_3

Q78. Consider the molecules CH_4 , NH_3 and H_2O . Which of the given statements is false? [2016]

1) The H—O—H bond angle in H_2O is smaller than the H—N—H bond angle in NH_3 .

2) The H—C—H bond angle in CH_4 is larger than the H—N—H bond angle in NH_3 .

3) The H—C—H bond angle in CH_4 , the H—N—H bond angle in NH_3 and the H—O—H bond angle in H_2O are all greater than 90° .

4) The H—O—H bond angle in H_2O is larger than the H—C—H bond angle in CH_4 .

Q79. Match List I with List II. [2024]

	List I		List II
	(Compound)		(Shape/geometry)
A.	NH_3	I.	Trigonal pyramidal
B.	BrF_5	II.	Square planar
C.	XeF_4	III.	Octahedral
D.	SF_6	IV.	Square pyramidal

Choose the correct answer from the options given below:

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

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

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

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

Q80. In the structure of ClF_3 , the number of lone pairs of electrons on central atom 'Cl' is [2018]

1) one

2) two

3) four

4) three

Q81. Match List I with List II.

[2024]

	List I		List II
	(Process)		(Condition)
A.	Isothermal process	I.	No heat exchange
B.	Isochoric process	II.	Carried out at constant temperature
C.	Isobaric process	III.	Carried out at constant volume
D.	Adiabatic process	IV.	Carried out at constant pressure

Choose the correct answer from the options given below:

- 1) A-IV, B-III, C-II, D-I
- 2) A-IV, B-II, C-III, D-I
- 3) A-I, B-II, C-III, D-IV
- 4) A-II, B-III, C-IV, D-I

Q82. Choose the correct statement for the work done in the expansion and heat absorbed or released when 5 litres of an ideal gas at 10 atmospheric pressure isothermally expands into vacuum until volume is 15 litres. **[2024]**

- 1) both the heat and work done will be greater than zero.
- 2) heat absorbed will be less than zero and work done will be positive.
- 3) work done will be zero and heat will also be zero.
- 4) work done will be greater than zero and heat will remain zero.

Q83. The work done during reversible isothermal expansion of one mole of hydrogen gas at 25°C from pressure of 20 atmosphere to 10 atmosphere is:
(Given $R = 2.0 \text{ cal K}^{-1} \text{ mol}^{-1}$) **[2024]**

- 1) 0 calorie
- 2) -413.14 calories
- 3) 413.14 calories
- 4) 100 calories

Q84. Which amongst the following options is the correct relation between change in enthalpy and change in internal energy? **[2023]**

- 1) $\Delta H - \Delta U = -\Delta nRT$
- 2) $\Delta H + \Delta U = \Delta nR$
- 3) $\Delta H = \Delta U - \Delta n_g RT$
- 4) $\Delta H = \Delta U + \Delta n_g RT$

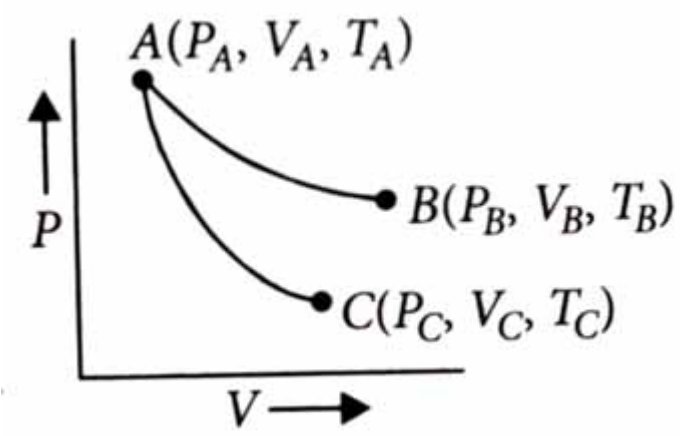
Q85. The correct option for free expansion of an ideal gas under adiabatic condition is **[2020]**

- 1) $q = 0$, $\Delta T = 0$ and $w = 0$
- 2) $q = 0$, $\Delta T < 0$ and $w > 0$
- 3) $q < 0$, $\Delta T = 0$ and $w = 0$
- 4) $q > 0$, $\Delta T > 0$ and $w > 0$

Q86. Under isothermal conditions, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is [Given that 1 L bar = 100 J] **[2019]**

- 1) 30 J
- 2) -30 J
- 3) 5 kJ
- 4) 25 J

Q87. Reversible expansion of an ideal gas under isothermal and adiabatic conditions are as shown in the figure.



$AB \rightarrow$ Isothermal expansion

$AC \rightarrow$ Adiabatic expansion

Which of the following options is not correct? [2019]

- 1) $\Delta S_{\text{isothermal}} > \Delta S_{\text{adiabatic}}$
- 2) $T_A = T_B$
- 3) $W_{\text{isothermal}} > W_{\text{adiabatic}}$
- 4) $T_C > T_A$

Q88. An ideal gas expands isothermally from 10^{-3}m^3 to 10^{-2}m^3 at 300 K against a constant pressure of 10^5N m^{-2} . The work done on the gas is [2019]

- 1) +270 kJ
- 2) -900 J
- 3) +900 kJ
- 4) -900 kJ

Q89.

For an endothermic reaction

- A. q_p is negative
- B. $\Delta_r H$ is positive
- C. $\Delta_r H$ is negative
- D. q_p is positive

Choose the correct answer from the options given below. [2024]

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

Q90. Match List - I with List - II. [2022]

List - I (Hydrides)	List - II (Nature)
(a) MgH_2	(i) Electron precise
(b) GeH_4	(ii) Electron deficient
(c) B_2H_6	(iii) Electron rich
(d) HF	(iv) Ionic

Choose the correct answer from the options given below:

- 1) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
- 2) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)
- 3) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)
- 4) (a) - (i), (b) - (ii), (c) - (iv), (d) - (iii)

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Q91. The second meiotic division leads to

- | | |
|--|---|
| 1) Separation of sex chromosomes | 2) Fresh DNA synthesis |
| 3) Separation of chromatids and centromere | 4) Separation of homologous chromosomes |

Q92. In meiosis, chromosome number becomes

- a) Half of its parent chromosome
- b) Same as that of parent chromosome
- c) One fourth of its parent chromosome
- d) None of the above

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

Q93. Consider the following statements about plant cytokinesis

- I. It usually occurs by cell plate method
- II. The spindle usually persists during cytokinesis
- III. Cell plate grows centrifugally

Which of the statements given above are correct?

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

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

Q94. Which type of cell division helps in regeneration of cells?

- a) Mitosis b) Amitosis c) Meiosis d) Karyokinesis

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

Q95. Which of the following statement(s) is/are not correct about meiosis?

- I. Meiosis involves pairing of homologous chromosomes and recombination between them
- II. Two diploid cells are formed at the end of meiosis-II
- III. Meiosis involves two sequential cycles of nuclear and cell division called meiosis-I and meiosis-II, but only a single cycle of DNA replication
- IV. Meiosis-I is initiated after the parental chromosome replication which produce identical sister chromatids at the S-phase

The correct option is

- a) I and III b) II only c) II and III d) I, II, III and IV

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

Q96. During meiosis, the alleles of the parental pair separate or segregated from each other. How many allele(s) is/are then transmitted to a gamete?

- a) Four b) Two c) Six d) One

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

Q97. The two chromatids of a metaphase chromosome represent

- a) Replicated chromosomes to be separated at anaphase
- b) Homologous chromosomes of a diploid set
- c) Non-homologous chromosomes joined at the centromere
- d) Maternal and paternal chromosomes joined at the centromere

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

Q98. In the process of mitotic division during interphase, chromosome material remains in the form of very loosely coiled threads called

- a) Chromosome b) Chromatin c) Chromatid d) Microtubules

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

Q99. Which is synthesized in G₁-phase?

- a) DNA polymerase b) Histones c) Nucleolar DNA d) Tubulin protein

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

Q100. Which of the following occurs more than one and less than five in a chromosome?

- a) Chromatid b) Chromomere c) Centromere d) Telomere

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

Q101. Five Kingdom system of classification suggested by R.H. Whittaker is not based on
[2014]

- | | |
|--|------------------------------------|
| 1) Presence or absence of a well-defined nucleus | 2) Mode of reproduction |
| 3) Mode of nutrition | 4) Complexity of body organization |

Q102. Given below are two statements: [2022]

Statement I: Mycoplasma can pass through less than 1 micron filter size.

Statement II: Mycoplasma are bacteria with cell wall.

In the light of the above statements, choose the most appropriate answer from the options given below:

- | | |
|---|---|
| 1) Both Statement I and Statement II are correct | 2) Both Statement I and Statement II are incorrect |
| 3) Statement I is correct but Statement II is incorrect | 4) Statement I is incorrect but Statement II is correct |

Q103. Match the organisms in Column-I with habitats in Column-II: [2019]

Column-I	Column-II
A. Halophiles	(i) Hot springs
B. Thermoacidophiles	(ii) Aquatic environment
C. Methanogens	(iii) Guts of ruminants
D. Cyanobacteria	(iv) Salty area

Select the correct answer from the options given below.

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

Q104. Which of the following are found in extreme saline conditions? **[2017]**

- | | |
|-----------------|--------------------|
| 1) Eubacteria | 2) Cyanobacteria |
| 3) Mycobacteria | 4) Archaeobacteria |

Q105. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals, and can survive without oxygen? **[2017]**

- | | |
|----------------|---------------|
| 1) Pseudomonas | 2) Mycoplasma |
| 3) Nostoc | 4) Bacillus |

Q106. Which of the following components provides a sticky character to the bacterial cell? **[2017]**

- | | |
|---------------------|--------------------|
| 1) Nuclear membrane | 2) Plasma membrane |
| 3) Glycocalyx | 4) Cell wall |

Q107. DNA replication in bacteria occurs **[2017]**

- | | |
|------------------------------|---------------------|
| 1) within nucleolus | 2) prior to fission |
| 3) just before transcription | 4) during S phase |

Q108. Methanogens belong to **[2016]**

- | | |
|--------------------|--------------------|
| 1) eubacteria | 2) archaeobacteria |
| 3) dinoflagellates | 4) slime moulds |

Q109. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the **[2016]**

- | | |
|----------------|----------------------|
| 1) methanogens | 2) eubacteria |
| 3) halophiles | 4) thermoacidophiles |

Q110. Archaeobacteria differ from eubacteria in **[2014]**

- | | |
|----------------------------|-------------------------|
| 1) cell membrane structure | 2) mode of nutrition |
| 3) cell shape | 4) mode of reproduction |

Q111. Read the following statements and choose the set of correct statements. **[2024]**

In the members of Phaeophyceae,

- A. Asexual reproduction occurs usually by biflagellate zoospores
- B. Sexual reproduction is by oogamous method only
- C. Stored food is in the form of carbohydrates, which is either mannitol or laminarin
- D. The major pigments found are chlorophyll a, c, carotenoids, and xanthophyll
- E. Vegetative cells have cellulosic walls, usually covered on the outside by a gelatinous coating of algin.

Choose the correct answer from the options given below:

- 1) A, B, C, and D only
- 2) B, C, D, and E only
- 3) A, C, D, and E only
- 4) A, B, C, and E only

Q112. Which classes of algae possess pigment fucoxanthin and pigment phycoerythrin, respectively? **[2023]**

- 1) Phaeophyceae and Chlorophyceae
- 2) Phaeophyceae and Rhodophyceae
- 3) Chlorophyceae and Rhodophyceae
- 4) Rhodophyceae and Phaeophyceae

Q113. Which of the following is incorrectly matched? **[2022]**

- 1) *Ectocarpus* - Fucoxanthin
- 2) *Ulothrix* - Mannitol
- 3) *Porphyra* - Floridean starch
- 4) *Volvox* - Starch

Q114. Hydrocolloid carrageen is obtained from **[2022]**

- 1) Chlorophyceae and Phaeophyceae
- 2) Phaeophyceae and Rhodophyceae
- 3) Rhodophyceae only
- 4) Phaeophyceae only

Q115. Which of the following algae produce Carrageen? **[2021]**

- 1) Blue-green algae
- 2) Green algae
- 3) Brown algae
- 4) Red algae

Q116. Which of the following algae contains mannitol as reserve food material? **[2021]**

- 1) *Ulothrix*
- 2) *Ectocarpus*
- 3) *Gracilaria*
- 4) *Volvox*

Q117. Genera like *Selaginella* and *Salvinia* produce two kinds of spores. Such plants are known as **[2021]**

- 1) heterosporous
- 2) homosorus
- 3) heterosorus
- 4) homosporous

Q118. Strobili cones are found in **[2020]**

- 1) *Salvinia*
- 2) *Pteris*
- 3) *Marchantia*
- 4) *Equisetum*

Q119. In bryophytes and pteridophytes, transport of male gametes requires **[2016]**

- 1) birds
2) water
- 3) wind
4) insects

Q120. Given below are two statements: **[2023]**

One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): In gymnosperms, the pollen grains are released from the microsporangium and carried by air currents.

Reason (R): Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

In the light of the above statements, choose the correct answer from the options given below:

- 1) (A) is true but (R) is false.
- 2) (A) is false but (R) is true.
- 3) Both (A) and (R) are true and (R) is the correct explanation of (A).
- 4) Both (A) and (R) are true but (R) is not the correct explanation of A.

Q121. Radial symmetry is not found in adults of phylum: **[2023]**

- 1) Coelenterata
2) Echinodermata
- 3) Ctenophora
4) Hemichordata

Q122. Consider the following features: **[2019]**

- (A) Organ system level of organisation
- (B) Bilateral symmetry
- (C) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics:

- 1) Annelida, Mollusca and Chordata
2) Annelida, Arthropoda and Chordata
- 3) Annelida, Arthropoda and Mollusca
4) Arthropoda, Mollusca and Chordata

Q123. Match List I with List II. **[2024]**

List I	List II
A. <i>Pterophyllum</i>	I. Hag fish
B. <i>Myxine</i>	II. Saw fish
C. <i>Pristis</i>	III. Angel fish
D. <i>Exocoetus</i>	IV. Flying fish

Choose the correct answer from the options given below:

- 1) A-II, B-I, C-III, D-IV
2) A-III, B-I, C-II, D-IV
- 3) A-IV, B-I, C-II, D-III
4) A-III, B-II, C-I, D-IV

Q124. The following are the statements about non-chordates: **[2024]**

- A. Pharynx is perforated by gill slits.
- B. Notochord is absent.
- C. Central nervous system is dorsal.
- D. Heart is dorsal if present.
- E. Post-anal tail is absent.

Choose the most appropriate answer from the options given below:

- 1) A and C only
- 2) A, B and D only
- 3) B, D and E only
- 4) B, C and D only

Q125. Select the correct statements. **[2023]**

- (A) Platyhelminthes are triploblastic pseudocoelomate and bilaterally symmetrical organisms.
- (B) Ctenophores reproduce only sexually and fertilisation is external.
- (C) In tapeworm, fertilisation is internal but sexes are not separate.
- (D) Ctenophores are exclusively marine, diploblastic and bioluminescent organisms.
- (E) In sponges, fertilisation is external and development is direct.

Choose the correct answer from the options given below:

- 1) (A), (C), and (D) only
- 2) (B), (C), and (D) only
- 3) (A) and (E) only
- 4) (B) and (D) only

Q126. Match List I with List II. **[2023]**

List I	List II
(A) Contractile vacuole	(I) Asterias
(B) Water vascular system	(II) Amoeba
(C) Canal system	(III) Spongilla
(D) Flame cells	(IV) Taenia

Choose the correct answer from the options given below:

- 1) (A)-(IV), (B)-(III), (C)-(I), (D)-(III)
- 2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- 3) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
- 4) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)

Q127. The unique mammalian characteristics are: **[2023]**

- 1) Hairs, pinna, and indirect development
- 2) Pinna, monocondylic skull, and mammary glands
- 3) Hairs, tympanic membrane, and mammary glands
- 4) Hairs, pinna, and mammary glands

Q128. Select the correct statements with reference to chordates. **[2023]**

- A. Presence of a mid-dorsal, solid, and double nerve cord.
- B. Presence of a closed circulatory system.
- C. Presence of paired pharyngeal gill slits.
- D. Presence of a dorsal heart.
- E. Triploblastic pseudocoelomate animals.

Choose the correct answer from the options given below:

- 1) B, D, and E only
- 2) C, D, and E only
- 3) A, C, and D only
- 4) B and C only

Q129. Exoskeleton of arthropods is composed of: [2022]

- | | |
|-----------|----------------|
| 1) Cutin | 2) Cellulose |
| 3) Chitin | 4) Glucosamine |

Q130. In which of the following animals, digestive tract has additional chambers like crop and gizzard? [2022]

- | | |
|-------------------------------|---------------------------------|
| 1) Corvus, Columba, Chameleon | 2) Bufo, Balaenoptera, Bangarus |
| 3) Catla, Columba, Crocodilus | 4) Pavo, Psittacula, Corvus |

Q131. The roots that originate from the base of the stem are [2020]

- | | |
|------------------|------------------|
| 1) fibrous roots | 2) primary roots |
| 3) prop roots | 4) lateral roots |

Q132. Identify the correct set of statements: [2022]

- (A) The leaflets are modified into pointed hard thorns in *Citrus* and *Bougainvillea*
(B) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin
(C) Stem is flattened and fleshy in *Opuntia* and modified to perform the function of leaves
(D) *Rhizophora* shows vertically upward growing roots that help to get oxygen for respiration
(E) Subaerially growing stems in grasses and strawberry help in vegetative propagation.

Choose the correct answer from the options given below:

- | | |
|-------------------------------|-------------------------------|
| 1) (B) and (C) only | 2) (A) and (D) only |
| 3) (B), (C), (D) and (E) only | 4) (A), (B), (D) and (E) only |

Q133. Stems modified into flat green organs performing the functions of leaves are known as [2016]

- | | |
|-----------------|--------------|
| 1) phylloclades | 2) scales |
| 3) cladodes | 4) phyllodes |

Q134. An example of edible underground stem is [2014]

- | | |
|-----------------|--------------|
| 1) carrot | 2) groundnut |
| 3) sweet potato | 4) potato |

Q135. Leaves become modified into spines in [2015]

- | | |
|------------|----------------|
| 1) onion | 2) silk cotton |
| 3) Opuntia | 4) pea |

Q136. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R): [2023]

Assertion (A): A flower is defined as a modified shoot wherein the shoot apical meristem changes to floral meristem.

Reason (R): Internode of the shoot gets condensed to produce different floral appendages laterally at successive nodes instead of leaves.

In the light of the above statements, choose the correct answer from the options given below:

- 1) (A) is true but (R) is false.
- 2) (A) is false but (R) is true.
- 3) Both (A) and (R) are true and (R) is the correct explanation of (A).
- 4) Both (A) and (R) are true but (R) is not the correct explanation of (A).

Q137. Which of the following is an example of actinomorphic flower? [2024]

- 1) Datura
- 2) Cassia
- 3) Pisum
- 4) Sesbania

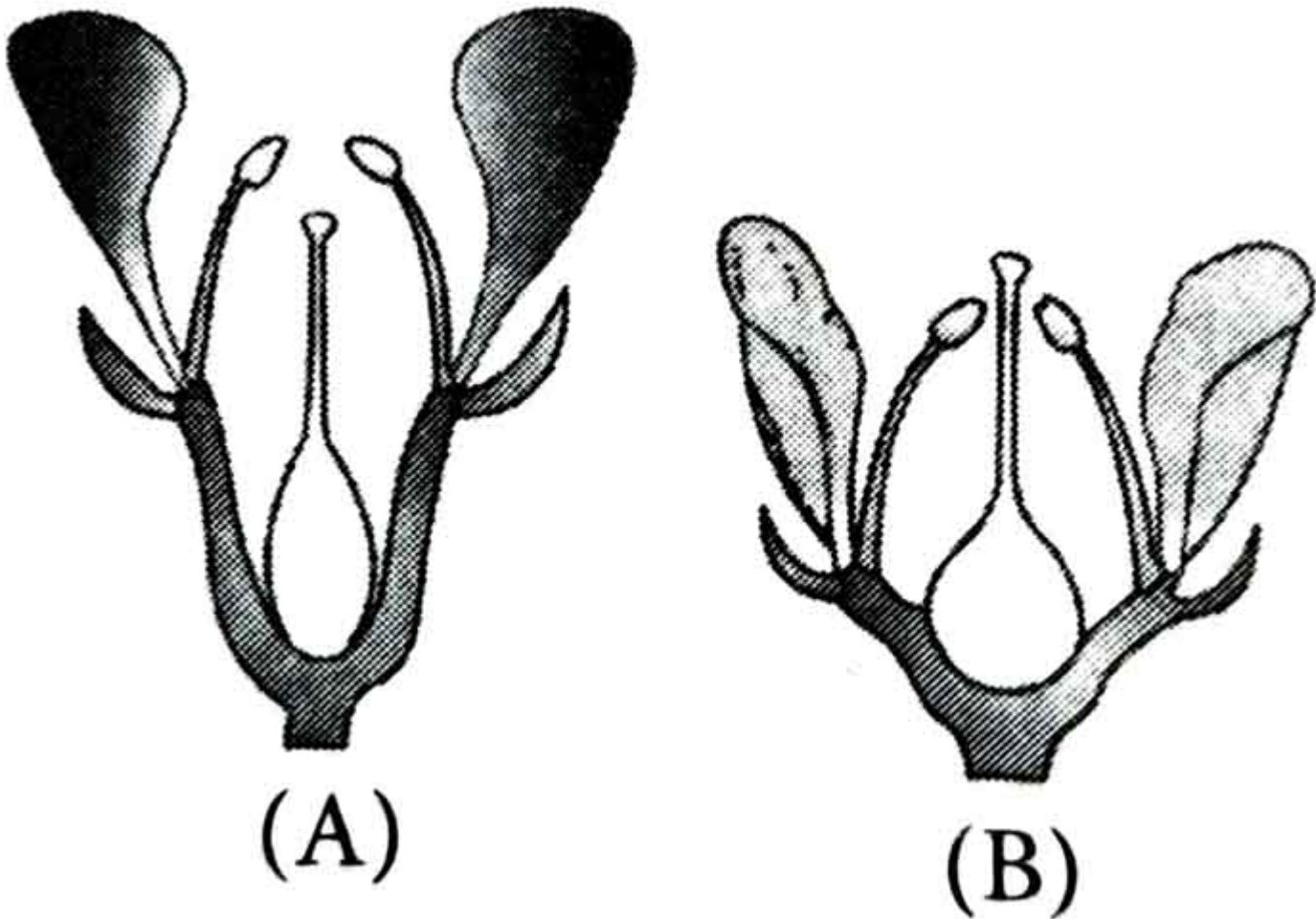
Q138. Match List I with List II. [2024]

List I (Types of stamens)	List II (Example)
A. Monadelphous	I. <i>Citrus</i>
B. Diadelphous	II. <i>Pea</i>
C. Polyadelphous	III. <i>Lily</i>
D. Epiphyllous	IV. <i>China-rose</i>

Choose the correct answer from the options given below:

- 1) A-IV, B-II, C-I, D-III
- 2) A-IV, B-I, C-II, D-III
- 3) A-I, B-II, C-IV, D-III
- 4) A-III, B-I, C-IV, D-II

Q139. Identify the type of flowers based on the position of calyx, corolla, and androecium with respect to the ovary from the given figures (A) and (B). [2024]



- 1) (A) Epigynous; (B) Hypogynous
- 2) (A) Hypogynous; (B) Epigynous
- 3) (A) Perigynous; (B) Epigynous
- 4) (A) Perigynous; (B) Perigynous

Q140. Consider the following plant tissues: [2023]

- (A) Axillary buds
- (B) Fascicular vascular cambium
- (C) Interfascicular cambium
- (D) Cork cambium
- (E) Intercalary meristem

Identify the lateral meristems among the above.

- | | |
|-------------------------------|-------------------------------|
| 1) (A), (C) and (D) only | 2) (B), (C) and (D) only |
| 3) (A), (B), (C) and (E) only | 4) (A), (B), (D) and (E) only |

Q141. Given below are two statements. **[2023]**

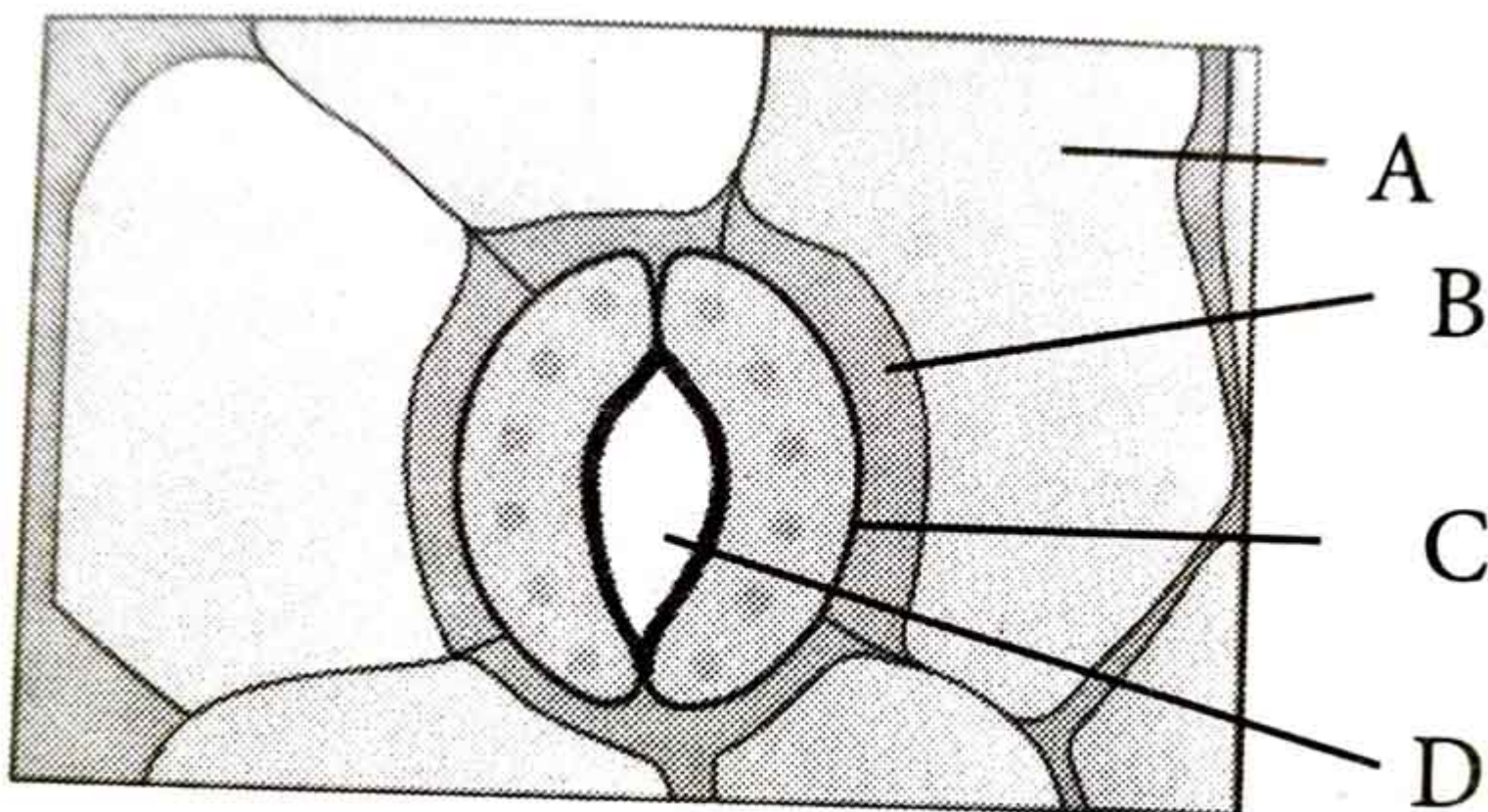
Statement I: Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.

Statement II: Exarch condition is the most common feature of the root system.

In the light of the above statements, choose the correct answer from the options given below:

- | | |
|--|---|
| 1) Statement I is correct but statement II is false. | 2) Statement I is incorrect but statement II is true. |
| 3) Both statement I and statement II are true. | 4) Both statement I and statement II are false. |

Q142. In the given figure, which component has thin outer walls and highly thickened inner walls?
[2024]



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

Q143. Stomata in grass leaf are **[2018]**

- | | |
|---------------------|------------------|
| 1) dumb-bell shaped | 2) kidney-shaped |
| 3) rectangular | 4) barrel-shaped |

Q144. Vascular bundles in monocotyledons are considered closed because **[2015]**

- | | |
|---|---|
| 1) there are no vessels with perforations | 2) xylem is surrounded all around by phloem |
|---|---|

3) a bundle sheath surrounds each bundle

4) cambium is absent

Q145. Bulliform cells are responsible for

[2024]

1) inward curling of leaves in monocots

2) protecting the plant from salt stress

3) increased photosynthesis in monocots

4) providing large spaces for storage of sugars

Q146. The transverse section of a plant part showed polyarch, radial and exarch xylem, with endodermis and pericycle. The plant part is identified as **[2023]**

1) monocot root

2) dicot root

3) dicot stem

4) monocot stem

Q147. Casparian strips occur in

[2018]

1) epidermis

2) pericycle

3) cortex

4) endodermis

Q148. Select the correct pair.

[2021]

1) Loose parenchyma cells rupturing the epidermis and forming a lens-shaped opening in bark -

Spongy parenchyma

2) Large colorless empty cells in the epidermis of grass leaves - **Subsidiary cells**

3) In dicot leaves, vascular bundles are surrounded by large thick-walled cells - **Conjunctive tissue**

4) Cells of medullary rays that form part of cambial ring cambium - **Interfascicular cambium**

Q149. Select the correct route for the passage of sperms in male frogs.

[2017]

1) Testes → Vasa efferentia → Kidney → Seminal vesicle → Urogenital duct → Cloaca

2) Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca

3) Testes → Vasa efferentia → Kidney → Bidder's canal → Urogenital duct → Cloaca

4) Testes → Bidder's canal → Kidney → Vasa efferentia → Urogenital duct → Cloaca

Q150. Frog's heart, when taken out of the body, continues to beat for some time.

[2017]

Select the best option from the following statements

(1) Frog is a poikilotherm.

(2) Frog does not have any coronary circulation.

(3) Heart is "myogenic" in nature.

(4) Heart is autoexcitable.

1) Only (4)

2) (1) and (2)

3) (3) and (4)

4) Only (3)

Q151. The concept of "Omnis cellula e cellula" regarding cell division was first proposed by **[2019]**

1) Aristotle

2) Rudolf Virchow

3) Theodore Schwann

4) Schleiden

Q152. Given below are two statements. [2023]

Statement I: In bacteria, the mesosomes are formed by the extensions of the plasma membrane.

Statement II: The mesosomes, in bacteria, help in DNA replication and cell wall formation.

In the light of the above statements, choose the most appropriate answer from the options given below:

- 1) Statement I is correct but statement II is incorrect.
- 2) Statement I is incorrect but statement II is correct.
- 3) Both statement I and statement II are correct.
- 4) Both statement I and statement II are incorrect.

Q153. Which of the following statements about inclusion bodies is incorrect? [2020]

- 1) They are not bound by any membrane.
- 2) These are involved in ingestion of food particles.
- 3) They lie free in the cytoplasm.
- 4) These represent reserve material in cytoplasm.

Q154. Select the wrong statement. [2016]

- 1) Bacterial cell wall is made up of peptidoglycan.
- 2) Pili and fimbriae are mainly involved in motility of bacterial cells.
- 3) Cyanobacteria lack flagellated cells.
- 4) Mycoplasma is a wall-less microorganism.

Q155. Which of the following structures is not found in a prokaryotic cell? [2015]

- 1) Mesosome
- 2) Plasma membrane
- 3) Nuclear envelope
- 4) Ribosome

Q156. The structures that help some bacteria to attach to rocks and/or host tissues are [2015]

- 1) mesosomes
- 2) holdfast
- 3) rhizoids
- 4) fimbriae

Q157. Which one of the following is not an inclusion body found in prokaryotes? [2015]

- 1) Glycogen granule
- 2) Polysome
- 3) Phosphate granule
- 4) Cyanophycean granule

Q158. The motile bacteria are able to move by [2014]

- 1) fimbriae
- 2) flagella
- 3) cilia
- 4) pili

Q159. Match List I with List II: [2024]

List I	List II
A. Axoneme	I. Centriole
B. Cartwheel pattern	II. Cilia and flagella

C. Crista	III. Chromosome
D. Satellite	IV. Mitochondria

Choose the correct answer from the options given below:

- 1) A-IV, B-III, C-II, D-I
2) A-IV, B-II, C-III, D-I
- 3) A-II, B-IV, C-I, D-III
4) A-II, B-I, C-IV, D-III

Q160. Given below are two statements: **[2024]**

Statement I: Mitochondria and chloroplast both are double membrane-bound organelles.

Statement II: Inner membrane of mitochondria is relatively less permeable, as compared to chloroplast.

In the light of the above statements, choose the appropriate answer from the options given below:

- 1) Both Statement I and Statement II are correct.
2) Both Statement I and Statement II are incorrect.
- 3) Statement I is correct but Statement II is incorrect.
4) Statement I is incorrect but Statement II is correct.

Q161. Match List I with List II. **[2024]**

List I	List II
A. Nucleolus	I. Site of formation of glycolipid
B. Centriole	II. Organisation like the cartwheel
C. Leucoplasts	III. Site for active ribosomal RNA synthesis
D. Golgi apparatus	IV. For storing nutrients

Choose the correct answer from the options given below:

- 1) A-III, B-II, C-IV, D-I
2) A-II, B-III, C-I, D-IV
- 3) A-III, B-IV, C-II, D-I
4) A-I, B-II, C-III, D-IV

Q162. The DNA present in chloroplast is **[2024]**

- 1) linear, double-stranded
2) circular, double-stranded
- 3) linear, single-stranded
4) circular, single-stranded

Q163. Which of the following statements are correct with respect to Golgi apparatus? **[2023]**

- (A) It is the important site of formation of glycoprotein and glycolipids.
- (B) It produces cellular energy in the form of ATP.
- (C) It modifies the protein synthesized by ribosomes on ER.
- (D) It facilitates the transport of ions.
- (E) It provides mechanical support.

Choose the most appropriate answer from the options given below:

- 1) (B) and (C) only
2) (A) and (C) only
- 3) (A) and (D) only
4) (D) and (E) only

Q164. Read the following statements on lipids and find out the correct set of statements: [2022]

- (A) Lecithin found in the plasma membrane is a glycolipid.
- (B) Saturated fatty acids possess one or more C=C bonds.
- (C) Gingelly oil has a lower melting point; hence remains as oil in winter.
- (D) Lipids are generally insoluble in water but soluble in some organic solvents.
- (E) When fatty acid is esterified with glycerol, monoglycerides are formed.

Choose the correct answer from the options given below:

- | | |
|---------------------------|---------------------------|
| 1) (A), (B), and (C) only | 2) (A), (D), and (E) only |
| 3) (C), (D), and (E) only | 4) (A), (B), and (D) only |

Q165. A dehydration reaction links two glucose molecules to produce maltose. If the formula for glucose is $C_6H_{12}O_6$ then what is the formula for maltose? [2022]

- | | |
|-------------------------|-------------------------|
| 1) $C_{12}H_{20}O_{10}$ | 2) $C_{12}H_{24}O_{12}$ |
| 3) $C_{12}H_{22}O_{11}$ | 4) $C_{12}H_{24}O_{11}$ |

Q166. Following are the statements with reference to lipids: [2021]

- (A) Lipids having only single bonds are called unsaturated fatty acids.
- (B) Lecithin is a phospholipid.
- (C) Trihydroxy propane is glycerol.
- (D) Palmitic acid has 20 carbon atoms, including the carboxyl carbon.
- (E) Arachidonic acid has 16 carbon atoms.

Choose the correct answer from the options given below:

- | | |
|---------------------|---------------------|
| 1) (B) and (E) only | 2) (A) and (B) only |
| 3) (C) and (D) only | 4) (B) and (C) only |

Q167. Identify the basic amino acid from the following [2020]

- | | |
|-------------|------------------|
| 1) Tyrosine | 2) Glutamic Acid |
| 3) Lysine | 4) Valine |

Q168. The two functional groups characteristic of sugars are [2018]

- | | |
|---------------------------|---------------------------|
| 1) hydroxyl and methyl | 2) carbonyl and methyl |
| 3) carbonyl and phosphate | 4) carbonyl and hydroxyl. |

Q169. A typical fat molecule is made up of [2018]

- | | |
|---|--|
| 1) one glycerol and one fatty acid molecule | 2) three glycerol and three fatty acid molecules |
| 3) three glycerol molecules and one fatty acid molecule | 4) one glycerol and three fatty acid molecules |

Q170. Which of the following are not secondary metabolites in plants? [2021]

- | | |
|-------------------------|--------------------------|
| 1) Rubber, gums | 2) Morphine, codeine |
| 3) Amino acids, glucose | 4) Vinblastine, curcumin |

Q171. Identify the incorrect pair. [2021]

- 1) Drugs – Ricin
- 3) Toxin – Abrin

- 2) Alkaloids – Codeine
- 4) Lectins – Concanavalin A

Q172. Secondary metabolites such as nicotine, strychnine, and caffeine are produced by plants for their [2020]

- 1) nutritive value
- 3) defence action
- 2) growth response
- 4) effect on reproduction

Q173. Concanavalin A is [2019]

- 1) a pigment
- 3) an essential oil
- 2) an alkaloid
- 4) a lectin

Q174. Which one of the following is the most abundant protein in animals? [2020]

- 1) Haemoglobin
- 3) Lectin
- 2) Collagen
- 4) Insulin

Q175. What is the name of the blood vessel that carries deoxygenated blood from the body to the heart in a frog? [2025]

- 1) Aorta
- 3) Pulmonary vein
- 2) Pulmonary artery
- 4) Vena cava

Q176. Which of the following statement is correct about location of the male frog copulatory pad? [2025]

- 1) First and Second digit of fore limb
- 3) Second digit of fore limb
- 2) First digit of hind limb
- 4) First digit of the fore limb

Q177. Find the statement that is **NOT** correct with regard to the structure of monocot stem. [2025]

- 1) Hypodermis is parenchymatous.
- 3) Vascular bundles are conjoint and closed.
- 2) Vascular bundles are scattered.
- 4) Phloem parenchyma is absent.

Q178. In frog, the Renal portal system is a special venous connection that acts to link : [2025]

- 1) Liver and intestine
- 3) Kidney and intestine
- 2) Liver and kidney
- 4) Kidney and lower part of body

Q179. Frogs respire in water by skin and buccal cavity and on land by skin, buccal cavity and lungs.

Choose the correct answer from the following : [2025]

- 1) The statement is true for water but false for land
- 3) The statement is false for water but true for land
- 2) The statement is true for both the environment
- 4) The statement is false for both the environment

- Q180.** Which of the following statements regarding cilia is not correct?
- a) The organised beating of cilia is controlled by fluxes of Ca^{+2} across the membrane
 - b) Cilia are hair-like cellular appendages
 - c) Microtubules of cilia are composed of tubulin
 - d) Cilia contain an outer ring of nine doublet microtubules surrounding two single microtubules
-

Answer Key

Q1 : B	Q2 : A	Q3 : 1	Q4 : 3	Q5 : 4	Q6 : A	Q7 : 1	Q8 : 4	Q9 : 4
Q10 : 1	Q11 : 4	Q12 : 4	Q13 : 4	Q14 : 4	Q15 : 1	Q16 : 2	Q17 : 1	
Q18 : 4	Q19 : 3	Q20 : 3	Q21 : 1	Q22 : 3	Q23 : 3	Q24 : 3	Q25 : 1	
Q26 : 1	Q27 : 1	Q28 : 4	Q29 : 3	Q30 : 3	Q31 : 3	Q32 : 3	Q33 : 2	
Q34 : 3	Q35 : 1	Q36 : 2	Q37 : 3	Q38 : 4	Q39 : 3	Q40 : 3	Q41 : 2	
Q42 : 2	Q43 : 1	Q44 : 4	Q45 : 1	Q46 : B	Q47 : A	Q48 : A	Q49 : C	
Q50 : A	Q51 : D	Q52 : 2	Q53 : 2	Q54 : 1	Q55 : 2	Q56 : 1	Q57 : 2	
Q58 : 3	Q59 : 3	Q60 : 4	Q61 : 1	Q62 : 2	Q63 : 3	Q64 : 1	Q65 : 4	
Q66 : 3	Q67 : 2	Q68 : 2	Q69 : 3	Q70 : 4	Q71 : 4	Q72 : 3	Q73 : 3	
Q74 : 2	Q75 : 4	Q76 : 4	Q77 : 3	Q78 : 4	Q79 : 1	Q80 : 2	Q81 : 4	
Q82 : 3	Q83 : 2	Q84 : 4	Q85 : 1	Q86 : 2	Q87 : 4	Q88 : 2	Q89 : 1	
Q90 : 1	Q91 : C	Q92 : A	Q93 : D	Q94 : A	Q95 :	Q96 : D	Q97 : A	
Q98 : B	Q99 : A	Q100 : D	Q101 : 1	Q102 : 3	Q103 : 1	Q104 : 4	Q105 : 2	
Q106 : 3	Q107 : 2	Q108 : 2	Q109 : 1	Q110 : 1	Q111 : 3	Q112 : 2		
Q113 : 2	Q114 : 3	Q115 : 4	Q116 : 2	Q117 : 1	Q118 : 4	Q119 : 2		
Q120 : 1	Q121 : 4	Q122 : 2	Q123 : 2	Q124 : 3	Q125 : 2	Q126 : 4		
Q127 : 4	Q128 : 4	Q129 : 3	Q130 : 4	Q131 : 1	Q132 : 3	Q133 : 1		