Comeback Test Series Dropper (2026)

Practice Test - 01

DURATION : 180 Minutes | **DATE : 17/01/2026** | **M. MARKS : 720**

Topics Covered

Physics:	Mathematical Tools, Units and Measurements, Motion in a straight line, Vectors, Motion in a plane
Chemistry:	Some Basic Concept of Chemistry, Redox Reaction, Solutions
Botany:	Cell - The Unit of Life, Cell Cycle and Cell Division
Zoology:	Structural Organization in Animals, Breathing and Exchange of Gases, Body Fluids and Circulation

GENERAL INSTRUCTIONS:

1. Immediately fill in the particulars on this page of the test booklet.
2. The test is of **180 minutes** duration and the Test Booklet consists of **180** multiple choice questions (four options with a single correct answer) from **Physics, Chemistry and Biology (Botany and Zoology)**. **45** questions in each subjects.
3. There is only **one correct** response for each question.
4. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses.
5. Each **correct** answer will give **4 Mark** while **1 Mark** will be **deducted** for a **wrong** answer. The maximum marks are **720**.
6. No student is allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, any electronic device, etc. inside the examination room/hall.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
8. Use of white fluid for correction is **not permissible** on the **Answer Sheet.**
9. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. However, the candidates are allowed to take away this Test Booklet with them.

OMR Instructions:

1. Use **blue/black dark** ballpoint pen.
2. Darken the bubbles completely. Don't put a **tick mark** or a **cross mark** where it is specified that you fill the bubbles completely. Half-filled or over-filled bubbles will not be read by the software.
3. Never use pencils to mark your answers.
4. Never use whiteners to rectify filling errors as they may disrupt the scanning and evaluation process.
5. Writing on the **OMR Sheet** is permitted on the specified area only and even small marks other than the specified area may create problems during the evaluation.
6. Multiple markings will be treated as invalid responses.

Name of the Student (In CAPITALS) : _____

Roll Number : _____

OMR Bar Code Number : _____

Candidate's Signature : _____ **Invigilator's Signature** _____

Practice Test - 01

Comeback Test Series Dropper (2026)

Q1 If, $\alpha = \frac{FV}{\beta}\log_e\left(\frac{2\pi\beta F}{V^2}\right)$ where F is force, V is velocity, then find the dimensional formula of α.

(1) $M^2L^{-1}T^{-2}$

(2) ML^2T^{-4}

(3) M^2LT^{-3}

(4) LT^{-3}

Q2 The magnitude of scalar product of two vectors is 8 and that of vector product is $\frac{8}{\sqrt{3}}$. The angle between the vectors is:

(1) 30° (2) 60°

(3) 45° (4) 53°

Q3 A ball is dropped from a tower. In the last second of its motion it travels a distance of 35 m. Find the height of the tower. (Take g = 10 m/s^2)

(1) 80 m (2) 60 m

(3) 65 m (4) 72 m

Q4 A particle is moving along x-axis such that its x coordinate varies with time t as $x = -32 + 2t^2$ (where x is in meter and t in second)

Statement I: Particle will cross the origin at $t = 4$ seconds.

Statement II: The particle is going along $+x$ axis at $t = 2$ seconds.

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.

Q5 If $\vec{a}$ and $\vec{b}$ makes an angle $\cos^{-1}\left(\frac{5}{9}\right)$ with each other, then $\left|\vec{a}+\vec{b}\right| = \sqrt{2}\left|\vec{a}-\vec{b}\right|$ for $\left|\vec{a}\right| = n\left|\vec{b}\right|$. The integer value of n is:

(1) 3 (2) 4

(3) 2 (4) 1

Q6 If $\vec{a}$, $\vec{b}$ and $\vec{c}$ are perpendicular to $\vec{b}+\vec{c}$, $\vec{c}+\vec{a}$ and $\vec{a}+\vec{b}$ respectively and if $\left|\vec{a}+\vec{b}\right| = 6$, $\left|\vec{b}+\vec{c}\right| = 8$ and $\left|\vec{c}+\vec{a}\right| = 10$ then $\frac{\left|\vec{a}+\vec{b}+\vec{c}\right|}{2}$ is equal to:

(1) 5 (2) 10

(3) 50 (4) 100

Q7 Let $y = \sin(\cos x^2)$. Evaluate $\frac{dy}{dx}$ at $x = \sqrt{\frac{\pi}{2}}$

(1) 0 (2) $-\sqrt{2\pi}$

(3) $\sqrt{2\pi}$ (4) –2

Q8 Two particles are released from the same height at an interval of 1 s. The separation between the two particles 3 s after the release of the second particle is ($g = 10$ m/s^2)

(1) 25 m (2) 30 m

(3) 35 m (4) 40 m

Q9 Three particles situated at the corners of an equilateral triangle of side 4 m, move with a constant speed of 2 m/s. Each particle maintains a direction towards the particle at the next corner. The time at which the particles will meet each other, will be:

(1) $\frac{3}{4}$ s (2) $\frac{1}{4}$ s

(3) $\frac{4}{3}$ s (4) 3 s

Q10 An object is projected vertically upwards from the top of a tower with an initial velocity of 40 m/s. (Take $g = 10\ \text{m/s}^2$). Match the physical quantities in **List-I** with their corresponding values in **List-II**.

List - I	List - II

(A)	Time taken to reach the maximum height (in second)	(I)	75
(B)	Speed of the object after 6 seconds (in m/s)	(II)	80
(C)	Maximum height reached above the tower (in m)	(III)	20
(D)	Magnitude of displacement (from the point of projection) after 5 seconds (in m)	(IV)	4

Choose the **correct** answer from the options given below:

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

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

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

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

Q11 Two particles are launched from the same point with an initial speed of 50 m/s. They are observed to have the same horizontal range. If one is projected at an angle of 30° with the ground, what is the difference in the maximum heights they attain? (Use $g = 10\ m/s^2$)

(1) 50 m (2) 62.5 m

(3) 75 m (4) 125 m

Q12 Two particles, *P* and *Q*, are in uniform circular motion. The radius of *P*'s path is twice the radius of *Q*'s path ($R_P = 2R_Q$). If they complete their circles in the same amount of time (i.e., they have the same period, *T*), what is the ratio of the centripetal acceleration of *P* to that of *Q* (a_P/a_Q)?

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

(3) 2 (4) 4

Q13 Consider the efficiency of Carnot engine is given by $\eta = \frac{\alpha\beta}{\sin\theta}\log_e\left(\frac{\beta x}{kT}\right)$, where α and β are constants. If T is temperature, k is Boltzmann constant, θ is angular displacement and x has the dimensions of length. Then, choose the **incorrect** option.

(1) Dimension of β is same as that of force.

(2) Dimension of $\alpha^{-1}x$ is same as that of energy.

(3) Dimension of $\eta^{-1}\sin\theta$ is same of $\alpha\beta$.

(4) Dimension of α is same of β.

Q14 A particle is moving along a straight line with an initial velocity *u* and a constant non-zero acceleration *a*. The direction of acceleration is opposite to the initial velocity (retardation). The particle comes to a momentary rest at a time t_{stop}.

It is observed that the moment the particle stops (t_{stop}) occurs exactly in the middle of the n^{th} second.

Which of the following **correctly** represents the magnitude of Displacement $\left(\left|\vec{s}\right|\right)$ and the total Distance (*D*) covered by the particle specifically during this n^{th} second?

(1) $\left|\vec{s}\right| = u,\ D = 0$

(2) $\left|\vec{s}\right| = 0,\ D = \frac{|a|}{4}$

(3) $\left|\vec{s}\right| = \frac{|a|}{4},\ D = \frac{|a|}{2}$

(4) $\left|\vec{s}\right| = 0,\ D = \frac{|a|}{8}$

Q15 The vector $\hat{i} + x\hat{j} + 3\hat{k}$ is rotated through an angle θ and doubled in magnitude, then it becomes $4\hat{i} + \left(4x - 2\right)\hat{j} + 2\hat{k}$. The values of *x* are:

(1) $-\frac{2}{3}$

(2) 2

(3) $\frac{2}{3}$

(4) both (1) and (2)

Q16 Find the equation of the line through (2, –1) and perpendicular to $3x - 4y + 5 = 0$

(1) $4x + 3y - 5 = 0$

(2) $4x + 3y - 5 = 7$

(3) $4x + 3y - 2 = 0$

(4) $4x + 3y - 11 = 0$

Q17 The minimum value of $y = 5x^2 - 2x + 5$ is:

(1) $\frac{22}{5}$ (2) $\frac{26}{5}$

(3) $\frac{24}{5}$ (4) $\frac{27}{5}$

Q18 n vectors $\left(\vec{A}_1, \vec{A}_2, \ldots, \vec{A}_n\right)$ are arranged head-to-tail to form a closed regular polygon. The magnitude of each vector is L. If a resultant vector $\vec{R}$ is defined as:

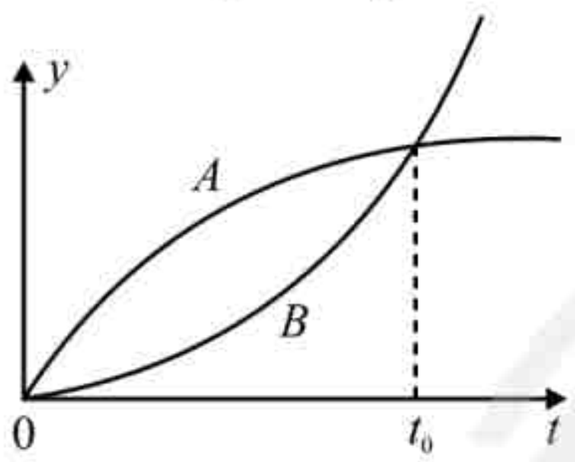
$$\vec{R} = \vec{A}_1 + \vec{A}_2 + \cdots + \vec{A}_{n-1} - \vec{A}_n$$

What is the magnitude of $\vec{R}$?

(1) 0 (2) L

(3) $2L$ (4) $\sqrt{n}L$

Q19 The position-time (y-t) graph of two particles A and B moving in straight line is shown in figure.



Choose the **correct** statements

A. Initial speed of particle A is more than initial speed of particle B.

B. At $t = t_0$, particle B overtakes particle A.

C. At $t = t_0$, speed of particle A is same as speed of particle B.

D. At $t = t_0$, particle A overtakes particle B.

(1) A and B only

(2) B and C only

(3) A, B and C only

(4) A, C and D only

Q20 Suppose a man running on horizontal road with speed 6 m/s finds the rain falling vertically. If he increases his speed to 9 m/s in the same direction then velocity of rain drops appears to make angle 30° with the vertical then speed of the rain with respect to ground is:

(1) $3\sqrt{7}$ m/s (2) $7\sqrt{3}$ m/s

(3) $2\sqrt{7}$ m/s (4) $7\sqrt{2}$ m/s

Q21 In a new system of units, unit of mass is α kg, unit of length is β m and unit of time is γ s. The numeric value of 10 joule in this new system of units is:

(1) $\frac{10\gamma^2}{\alpha\beta^2}$

(2) $\frac{10\gamma}{\alpha\beta}$

(3) $\frac{10\gamma^2}{\alpha^2\beta^2}$

(4) $\frac{10\beta}{\alpha\gamma}$

Q22 A particle starts from rest whose acceleration a varies with time t (in second) as $a = (3t^2)$ m/s^2. The velocity of the particle at $t = 1$ s is:

(1) 2 m/s (2) 1 m/s

(3) 3 m/s (4) 4 m/s

Q23 A physics student performs an experiment to determine the acceleration due to gravity (g) using a simple pendulum.

The student measures the length of the pendulum to be 100.0 cm using a meter scale that has a least count (resolution) of 1 mm.

To determine the time period, the student measures the total time taken for 50 oscillations. The stopwatch used indicates a time of 50 s and has a least count (resolution) of 0.5 s.

Based on these measurements, what is the percentage error in the calculated value of g?

(1) 1.1% (2) 2.1%

(3) 3.1% (4) 4.2%

Q24 A particle is performing Uniform Horizontal Circular Motion with a constant speed v along a circle of radius R.

Let a_{inst} be the magnitude of the instantaneous acceleration of the particle.

Let a_{avg} be the magnitude of the average acceleration vector of the particle over the time interval it takes to complete exactly half a revolution.

Which of the following relations between a_{avg} and a_{inst} is **correct**?

(1) $a_{\text{avg}} = a_{\text{inst}}$

(2) $a_{\text{avg}} = 0$

(3) $a_{\text{avg}} = \frac{2}{\pi} a_{\text{inst}}$

(4) $a_{\text{avg}} = \frac{\pi}{2} a_{\text{inst}}$

Q25 A swimmer can swim with a speed of 6 km/h in still water. A river 1.5 km wide flows at a rate of 3

km/h. If the swimmer crosses the river along the shortest path (no drift), then the time elapsed will be:

(1) $\frac{1}{2\sqrt{3}}h$ (2) $\frac{\sqrt{3}}{2}h$

(3) $\frac{1}{3\sqrt{3}}h$ (4) $\frac{2}{3}h$

Q26 A parkour athlete plans to run along a rooftop and jump horizontally to land on the roof of the next building. The roof of the next building is 19.6 metres below the first one and 15 metres away from it. Taking $g = 9.8\ \mathrm{m/s^2}$, what should be his minimum rooftop speed so that he can successfully make the jump?

(1) 5.0 m/s (2) 7.5 m/s

(3) 9.8 m/s (4) 15.0 m/s

Q27 A patrol train moves horizontally with a uniform speed *u*. A cannon mounted on the train fires a shell with a velocity (v) at an angle θ with the horizontal in the same direction as the train's motion, relative to the train. To an observer standing on the ground, the horizontal range of the shell is:

(1) $\frac{v^2 \sin 2\theta}{g}$

(2) $\frac{2v \sin\theta(u+v\cos\theta)}{g}$

(3) $\frac{2u \sin\theta(v+u\cos\theta)}{g}$

(4) $\frac{2u \cos\theta(v+u\sin\theta)}{g}$

Q28 A student measures the diameter of a cylinder using a Vernier calliper. While taking the reading, it is found that, when the jaws are completely closed, the zero of the vernier scale lies to the right of the zero of the main scale by 2 Vernier divisions. Which of the following statements is correct about the value of the diameter recorded by the student?

(1) The recorded diameter is greater than the true diameter.

(2) The recorded diameter is less than the true diameter.

(3) The recorded diameter is equal to the true diameter.

(4) The error cannot be determined without knowing the least count.

Q29 A body falls from a height of 20 m and pierces into sand. The sand offers an average retardation of 50g. To what depth will the body penetrate the sand? ($g = 10\ \mathrm{m/s^2}$)

(1) 0.4 m (2) 0.5 m

(3) 1.0 m (4) 2.0 m

Q30 The displacement (x)-time (t) graph of a particle is shown in figure. Which of the following is **correct**?

(1) Particle starts with zero velocity and variable acceleration.

(2) Particle starts with non-zero velocity and variable acceleration.

(3) Particle starts with zero velocity and uniform acceleration.

(4) Particle starts with non-zero velocity and uniform acceleration.

Q31 Two racing cars, X and Y, start from rest and race along a straight track with constant accelerations of $9\ \mathrm{m\,s^{-2}}$ and $4\ \mathrm{m\,s^{-2}}$ respectively. Car *X* crosses the finish line 2 seconds earlier than car *Y*. What is the difference in their speeds at the moment they cross the finish line?

(1) 6 m/s (2) 12 m/s

(3) 18 m/s (4) 10 m/s

Q32 Two particles, *P* and *Q*, are projected horizontally from the same point at certain height towards a vertical wall located at a horizontal distance *x*. Particle *P* is projected with speed *v* and Particle *Q* is projected with speed 3*v*. Both particles strike the wall. Let $\left|\Delta\vec{v}_P\right|$ and $\left|\Delta\vec{v}_Q\right|$ represent the magnitude of the change in velocity vector for particles P and Q respectively, from the moment of launch until the moment of impact. What is the ratio $\frac{\left|\Delta\vec{v}_P\right|}{\left|\Delta\vec{v}_Q\right|}$?

(1) 1 : 3 (2) 1 : 1

(3) 3 : 1 (4) 9 : 1

Q33 If momentum (P), area (A), and time (T) are considered as fundamental quantities, then the dimension of Energy Density is given by:

(1) $\left[P^1A^{-1}T^{-1}\right]$ (2) $\left[P^1A^{-1/2}T^{-1}\right]$

(3) $\left[P^1A^{-3/2}T^1\right]$ (4) $\left(\left[P^2A^{-1}T^{-2}\right]\right.$

Q34 Two towns A and B are connected by a regular bus service with a bus leaving in either direction every T minutes. A cyclist moving at 20 km/h in the direction A to B notices that a bus goes past him every 18 minutes in the direction of his motion, and every 6 minutes in the opposite direction. The speed of the bus and the time period T are respectively:

(1) 40 km/h, 9 min

(2) 60 km/h, 12 min

(3) 30 km/h, 15 min

(4) 40 km/h, 12 min

Q35 A student measures the diameter of a steel ball using a vernier caliper. The main scale has divisions in millimeters (1 MSD = 1 mm). The vernier scale has 50 divisions which coincide with 49 divisions of the main scale. When the jaws are closed without the object, the zero of the vernier scale lies to the left of the main scale zero, and the 5^{th} vernier division coincides with a main scale division.

When measuring diameter of the ball, the main scale reading is 24 mm and the 30th vernier division coincides with a main scale division. What is the **correct** value of diameter of the ball?

(1) 24.60 mm

(2) 24.50 mm

(3) 24.70 mm

(4) 24.40 mm

Q36 The screw of a micrometer advances by 2 mm in one full rotation. If the instrument needs to measure variations as small as 10 μm, the circular scale must have at least how many divisions?

(1) 100 (2) 50

(3) 200 (4) 400

Q37 For a particle moving along x-axis, acceleration is given as $a = x$. Find the position x (in m) as a function of time if at $t = 0$, $x = 1$ m and $v = 1$ ms^{-1}

(1) e^{t+1} (2) e

(3) e^t (4) None of these

Q38 The radius and height of a solid cylinder are measured to be $r = 5.00 \pm 0.10$ cm and $h = 20.0 \pm 0.1$ cm, respectively. What will be the value of its volume with the appropriate error limits and appropriate significant figure?

(1) 1570 ± 71 cm^3

(2) 1570 ± 70 cm^3

(3) 1571 ± 70.65 cm^3

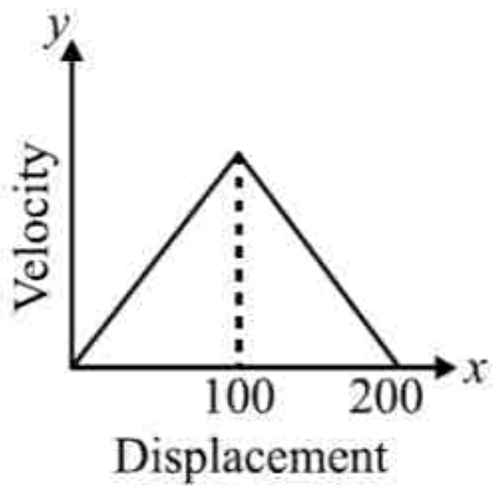
(4) 1600 ± 100 cm^3

Q39 u_A and u_B represent the velocities of two balls A and B thrown from same point over a horizontal ground at angle of projections 37° and 45° respectively with horizontal such that both the balls land at same point on ground. Value of $\frac{u_A}{u_B}$ is equal to:

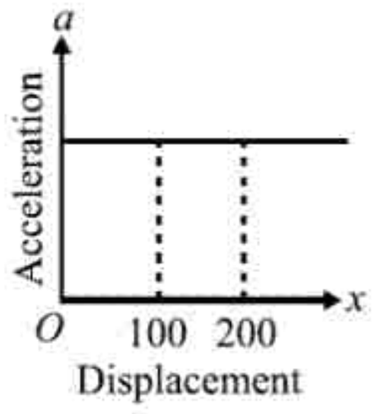
(1) $\frac{24\sqrt{6}}{5}$ (2) $\frac{5\sqrt{6}}{12}$

(3) $\frac{12}{5\sqrt{6}}$ (4) $\frac{5\sqrt{6}}{24}$

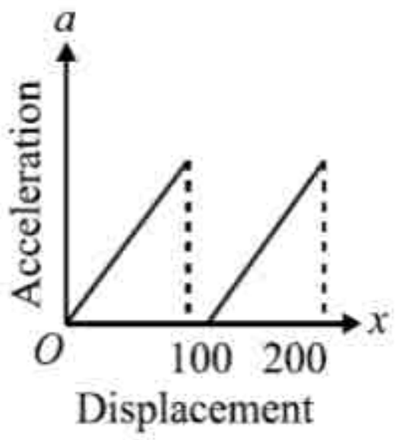
Q40 Velocity (v) versus displacement (x) plot of a body moving along a straight line is as shown in the graph. The corresponding plot of acceleration (a) as a function of displacement (x) is:



(1)



(2)



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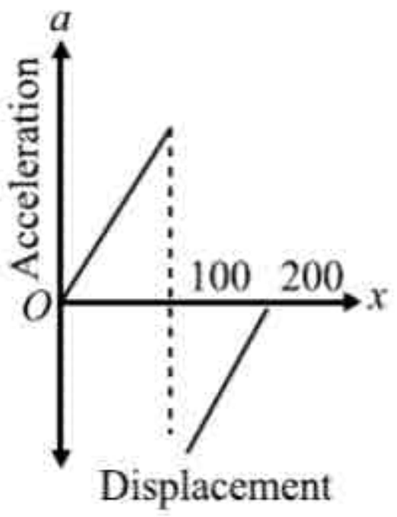
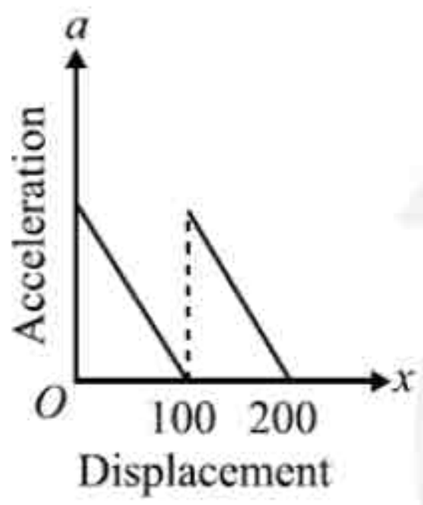


(4)



Q41 If G is universal gravitation constant and g is acceleration due to gravity, then dimensional formula of $\frac{G}{g}$ will be:

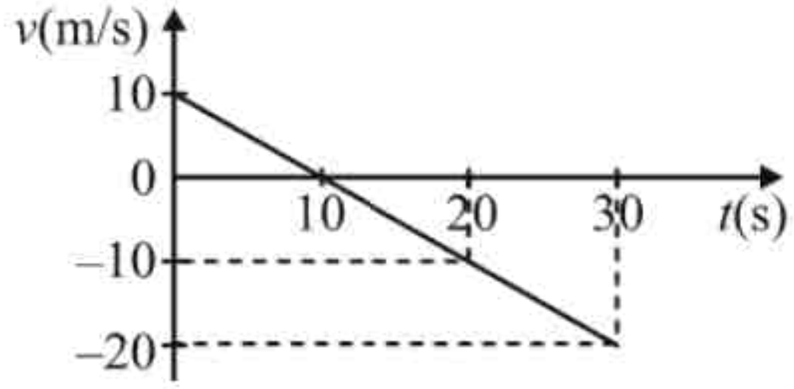
(1) $[M^{-1}L^2]$

(2) $[M^{-1}L]$

(3) $[M^{-2}L]$

(4) $[M^{-1}L^{-2}]$

Q42 The velocity-time (v-t) graph for a particle moving on a straight line is shown in the figure.



(A) The particle has a constant acceleration.

(B) The particle has never turned around.

(C) The particle has zero displacement from $t = 0$ to $t = 30$ s.

(D) The average speed in the interval 0 to 10 s is the same as the average speed in the interval 10 s to 20 s.

Choose the option containing **correct** statements.

(1) A and B only (2) B and C only

(3) C and D only (4) A and D only

Q43 A man is running up hill with a velocity $\left(2\hat{i} + 3\hat{j}\right)$ m/s w.r.t. ground. He feels that the rain drops are falling vertically with velocity 1 m/s, then the velocity of the rain w.r.t. ground is:

(1) $\left(2\hat{i} - 2\hat{j}\right)$ m/s

(2) $\left(2\hat{i} + 2\hat{j}\right)$ m/s

(3) $\left(-2\hat{i} + 3\hat{j}\right)$ m/s

(4) $\left(-2\hat{i} - \hat{j}\right)$ m/s

Q44 A stone is thrown vertically up with an initial velocity of 40 m/s. It crosses a point at height h twice, with a time interval of 2 s between the two crossings. The value of h is: (Take $g = 10\ \text{m/s}^2$)

(1) 60 m (2) 75 m

(3) 35 m (4) 80 m

Q45 A superfast train of length 150 m is moving at 90 km/hr. A goods train of length 250 m is moving at 50 km/hr. What is the ratio of time taken to cross each other completely in the same direction versus the opposite direction?

(1) $\frac{7}{2}$ (2) $\frac{5}{2}$

(3) $\frac{9}{4}$ (4) $\frac{7}{5}$

Q46 The **correct** increasing order of mass of the following samples is:

I. 2.24 L of $N_2(g)$ at STP

II. 3.011×10^{22} molecules of $H_2(g)$

III. 0.05 moles of $O_2(g)$

(Given that molar mass of $N_2 = 28\ \text{g mol}^{-1}$ and molar mass of $O_2 = 32\ \text{g mol}^{-1}$)

(1) I < II < III

(2) III < II < I

(3) III < I < II
(4) II < III < I

Q47 Number of significant figures in the result of $\left(2.50 \times 10^8\right) - \left(0.480 \times 10^8\right)$ is:
(1) 8 (2) 3
(3) 2 (4) 11

Q48 One litre of oxygen at STP is allowed to react with three times of carbon monoxide at STP. The volume of gases found after the reaction is:
$2CO + O_2 \rightarrow 2\,CO_2$
(1) O_2 = 0.5 L, CO_2 = 2 L
(2) O_2 = 0.25 L, CO_2 = 1 L
(3) CO = 2 L, CO_2 = 1 L
(4) CO = 1 L, CO_2 = 2 L

Q49 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: In any chemical reaction, the reactant present in the least number of moles is always the limiting reagent..
Reason R: The limiting reagent is the Reactant that gets completely consumed according to the balanced equation..
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.

Q50 8.3 g of A combines with x g of B to form 4.2 g of C and 5.9 g of D. What would be the value of x if the law of conservation of mass is said to be true?
(1) 1.8 g (2) 18.4 g
(3) 6.6 g (4) 0.2 g

Q51 An aqueous solution is made by dissolving glucose $\left(C_6H_{12}O_6\right)$ and urea $\left(NH_2CONH_2\right)$ in water. The mole ratio of glucose and water is $1:10$. If the masses of glucose and urea are in $3:1$ ratio, the mole fraction of glucose in the solution is :
(Molar mass of glucose = 180 g mol^{-1}, molar mass of urea = 60 g mol^{-1})
(1) $\frac{1}{11}$
(2) $\frac{1}{12}$
(3) $\frac{1}{10}$
(4) $\frac{3}{4}$

Q52 5 moles of liquid X and 10 moles of liquid Y make a solution having a vapour pressure of 70 torr. The vapour pressures of pure X and Y are 63 torr and 78 torr respectively. Which of the following is **true** regarding the described solution?
(1) The solution is ideal.
(2) The solution has volume greater than the sum of individual volumes.
(3) The solution-shows positive deviation.
(4) The solution shows negative deviation.

Q53 Two liquids A and B form ideal solutions. At 300 K, the vapour pressure of solution containing 1 mole of A and 3 mole of B is 550 mm Hg. At the same temperature, if one more mole of B is added to this solution, the vapour pressure of the solution increases by 10 mm Hg. The vapour pressure of A and B in their pure states (in mm Hg) are respectively
(1) 400,600 (2) 500,500
(3) 600,400 (4) 300, 700

Q54 Which of the following aqueous solution will have the highest boiling point?
(Molar mass of sugar = 342 g mol^{-1})
(Molar mass of glucose = 180 g mol^{-1})
(Molar mass of urea = 60 g mol^{-1})
(1) 34.2%(w/w) sugar
(2) 18%(w/w) glucose
(3) 6.00%(w/w) urea
(4) All of these

Q55 Based on the information given below mark the **correct** option.
(A) In bromoethane and chloroethane mixture intermolecular interactions of A-A and B-B type

are nearly the same as A-B type interactions.
(B) In ethanol and acetone mixture $A - A$ or $B - B$ type intermolecular interactions are stronger than A-B type interactions.
(C) In chloroform and acetone mixture A-A or B-B type intermolecular interactions are weaker than A-B type interactions.
(1) Solution (B) and (C) will follow Raoult's law.
(2) Solution (A) will follow Raoult's law.
(3) Solution (B) will show negative deviation from Raoult's law.
(4) Solution (C) will show positive deviation from Raoult's law.

Q56 Which of the following pairs will undergo comproportionation?
(1) MnO_4^- and Mn^{2+}
(2) Cl_2 and Cl^-
(3) Fe^{2+} and Fe^{3+}
(4) Both (1) and (3)

Q57 Equivalent mass of $KMnO_4$ in acidic medium, and neutral medium respectively are $\frac{M}{5}$, $\frac{M}{3}$.
Reduced products respectively are:
(1) MnO_2 and Mn^{2+}
(2) MnO_2 and MnO_4^{2-}
(3) Mn^{2+} and MnO_2
(4) Mn^{2+} and MnO_4^{2-}

Q58 If 10 moles of fructose are dissolved in 1 kg each of given solvents then ΔT_b will be maximum for:
(1) Water ($K_b = 0.52$ K kg mol^{-1})
(2) Ethanol ($K_b = 1.20$ K kg mol^{-1})
(3) Cyclohexane ($K_b = 2.79$ K kg mol^{-1})
(4) Benzene ($K_b = 2.53$ K kg mol^{-1})

Q59 A solution is obtained by mixing 200 g of 10% solution and 400 g of 20% solution by mass. The mass percentage of the resulting solution is:
(1) 23.26% (2) 11.11%
(3) 16.66% (4) 27.63%

Q60 The value of van't Hoff factor (i) for 80% dimerisation of ethanoic acid in benzene is:
(1) 0.5 (2) 0.4
(3) 0.8 (4) 0.6

Q61 If an element shows both +5 and -3 oxidation states, it is most likely to show disproportionation in which state?
(1) +5 (2) –3
(3) 0 (4) +1

Q62 Given below are two statements: one is labelled as Assertion A and other is labelled as Reason R:
Assertion A: People living at high altitudes or climbers become weak and unable to think clearly.
Reason R: At high altitude the partial pressure of oxygen is less than that of ground level, this leads to low concentrations of oxygen in the blood and tissues.
In the light of 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 and R is NOT the correct explanation of A.

Q63 4.4 g of CO_2 and 2.24 litre of H_2 at STP are mixed in a container. The total number of molecules present in the container will be:
(Molar mass of CO_2 = 44 g mol^{-1})
(1) 6.022×10^{23}
(2) 1.2044×10^{23}
(3) 1.2044×10^{24}
(4) 6.023×10^{24}

Q64 Which of the following statement is **not** correct?
(1) Empirical formula mass always divides molecular mass.
(2) Molecular formula is always an intergral multiple of empirical formula.
(3) Empirical formula represents actual composition.
(4) Empirical formula is independent of molecular structure.

Q65 Given below are two statements: one is labelled as Assertion A and other is labelled as

Reason R:

Assertion(A): The number of molecules in 2 moles of NH_3 is **not** equals to the number of molecules in 4 moles of CH_4.

Reason(R): Both species contains same number of atoms.

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

(1) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

(2) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

(3) Assertion (A) is true and Reason (R) is false.

(4) Assertion (A) is false and Reason (R) is true.

Q66 Henry's law is most accurate when:

(1) gas is highly soluble

(2) gas does not react with solvent

(3) pressure is very high

(4) Both (2) and (3)

Q67 In the reaction between ozone and hydrogen peroxide, H_2O_2 acts as

(1) Oxidising agent

(2) Reducing agent

(3) Bleaching agent

(4) Both oxidising and bleaching agent

Q68 The oxidation number of each sulphur in $Na_2S_4O_6$ is

(1) 2.5 (all four have 2.5 each)

(2) 2 and 4 (two S have +2 and the other two have +3)

(3) 2 and 4 (three S have +2 and S has +4)

(4) 5 and 0 (two S have +5 and the other twoS have 0)

Q69 Given below are two statements:

Statement-I: In the reaction, $2\,Na_2\,S_2O_3 + I_2 \rightarrow Na_2\,S_4O_6 + 2\,NaI$, the oxidation state of sulphur is increased.

Statement-II: In the reaction, $3\,Br_2 + 6\,CO_3^{2-} + 3H_2O \rightarrow 5\,Br^- + BrO_3^- + 6\,HCO_3^-$ bromine is oxidized and carbonate is reduced.

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

(1) Statement I and Statement II both are correct.

(2) Statement I and Statement II both are incorrect.

(3) Statement I is correct, but Statement II is incorrect.

(4) Statement I is incorrect, but Statement II is correct.

Q70 Given below are two statements: one is labelled as Assertion A and other is labelled as Reason R:

Assertion (A): $2CuCl \longrightarrow CuCl_2 + Cu$ is a disproportionation reaction.

Reason(R): All transition metals show disproportionation reactions.

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

(1) Both Assertion (A) and Reason (R) are the true, and Reason (R) is a correct explanation of Assertion (A).

(2) Both Assertion (A) and Reason (R) are the true, but Reason (R) is not a correct explanation of Assertion (A).

(3) Assertion (A) is true, and Reason (R) is false.

(4) Assertion (A) is false, and Reason (R) is true.

Q71 Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Mole fraction of 18 g glucose ($C_6H_{12}O_6$) in 90 g of water.	I.	$\frac{1}{56.55}$
B.	Mole fraction of the solute in one molal aqueous solution	II.	1
C.	Mole fraction of solvent, if mole fraction of solute is 0.8 in a solution	III.	$\frac{1}{51}$
D.	Sum of mole fraction of solute and solvent in a solution	IV.	$\frac{1}{5}$

Choose the **correct** answer from the options given below:

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

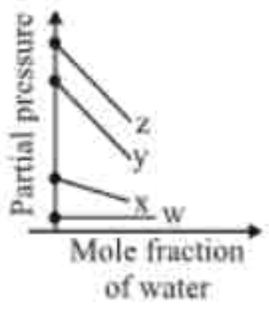
(2) A-III, B-I, C-IV, D-II

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

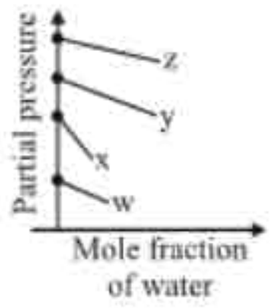
(4) A-II, B-III, C-IV, D-I

Q72 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:

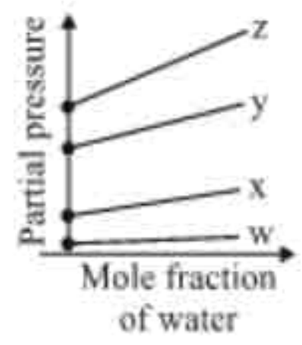
(1)



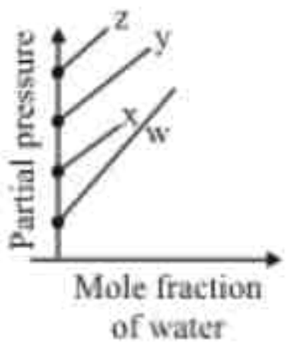
(2)



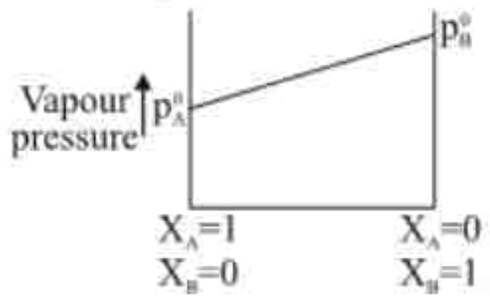
(3)



(4)



Q73 The following graph is plotted between the vapour pressures of two volatile liquids against their respective mole fractions.



Which of the following statement is **correct**?

(1) When $X_A = 1$ and $X_B = 0$, then $p_{total} = p_A^0$

(2) When $X_B = 0$ and $X_A = 0$, then $p_{total} = p_B^0$

(3) When $X_A = 0$ and $X_B = 0$, then $p_{total} = p_A^0$

(4) When $X_B = 1$ and $X_A = 0$, then $p_{total} = p_A^0$

Q74 The vapour pressure of water at T (K) is 20 mm Hg. The following solutions are prepared at T (K):

I. 1 mole of urea is dissolved in 180 g of water.

II. 0.1 mole of glucose is dissolved in 180 g of water.

III. 0.01 mole of sucrose is dissolved in 180 g of water.

Identify the **correct** order of relative lowering in vapour pressures of solutions:

(Molar mass of urea = 60 g mol^{-1}

Molar mass of glucose = 180 g mol^{-1}

Molar mass of sucrose = 342 g mo^{l-1})

(1) III < I < II

(2) II < III < I

(3) III < II < I

(4) I < II < III

Q75 For an ideal dilute solution:

(1) Both solute and solvent obey Raoult's law.

(2) Solvent obeys Raoult's law, solute obeys Henry's law.

(3) Solute obeys Raoult's law, solvent obeys Henry's law.

(4) Neither obeys Raoult's law nor Henry's law.

Q76 During depression of freezing point experiment, an equilibrium is established between the molecules of:

(1) liquid solvent and solid solvent

(2) liquid solute and solid solvent

(3) liquid solute and solid solute

(4) liquid solvent and solid solute

Q77 How many concentration terms among the following are temperature dependent?

Molarity, Molality, Mole fraction, density, % by mass

(1) 2 (2) 3

(3) 4 (4) 5

Q78 Match **List-I** with **List-II**.

List-I	List-II

A.	Oxidation state of central Br atom in Br_3O_8	I.	-1
B.	Oxidation state of S in S_8	II.	+4
C.	Oxidation state of H in NaH	III.	0
D.	Oxidation state of O in O_2F_2	IV.	+1

Choose the **correct** answer from the options given below:

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

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

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

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

Q79 Which of the following can **not** act as reducing agent?

(1) H_2SO_4 (2) $HClO_3$

(3) H_3PO_2 (4) Na_2SO_3

Q80 In the given reaction, the equivalent weight of N_2 and NH_3 are respectively $\frac{28}{x}$ and $\frac{17}{y}$. The value of x and y respectively are:

$$N_2 + 3H_2 \rightarrow 2NH_3$$

(1) 3 and 6 (2) 3 and 3

(3) 6 and 6 (4) 6 and 3

Q81 The oxidation state of oxygen atoms in CrO_5 are:

(1) –1 and –2

(2) –2 and $-\frac{1}{2}$

(3) $-\frac{1}{2}$ and $-\frac{1}{3}$

(4) -1 and $-\frac{1}{3}$

Q82 Consider the reaction:

$$xFe^{2+} + yCr_2O_7^{2-} + zH^+ \rightarrow xFe^{3+} + 2YCr^{3+} + \frac{z}{2}H_2O$$

The sum of x, y and z for the balanced reaction is

(1) 19 (2) 22

(3) 20 (4) 21

Q83 Consider a binary solution of components A and B. If the vapour pressure of the solution is given by $p = 120 - 40\chi_B$ (in mm Hg) where χ_B is the mole fraction of B, what can be concluded about the solution?

(1) A and B form a maximum boiling azeotrope.

(2) The solution is ideal.

(3) The solution shows negative deviation.

(4) The solution shows positive deviation.

Q84 An organic compound (molar mass = 200 g/mol) contains 14% by mass of nitrogen. Number of atoms of nitrogen in one molecule of organic compound is;

(1) 2 (2) 3

(3) 4 (4) 5

Q85 **Incorrect** statement among the following is:

(1) The tanks used by scuba divers are filled with air diluted with helium

(2) Solubility of a gas in liquid decrease with increase of temperature

(3) Pressure have significant effect on solubility of solids in liquids

(4) The blocking of capillaries in scuba divers creates a medical condition known as bends.

Q86 Match the List-I with List-II.

List-I		List-II	
(A)	Molarity of pure water	(I)	1 M
(B)	Molarity of 1 mole of solute in 1 L of solution	(II)	55.55 M
(C)	Molarity of 49 g of H_2SO_4 (molar mass = 98 g) dissolved in 100 mL of solution	(III)	5 M
(D)	Molarity of 1 mole of NaOH (molar mass = 40) dissolved in 100 g of solution (ρ of solution = 1.2 g/mL)	(IV)	12 M

Choose the **correct** answer from the options given below:

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

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

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

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

Q87 The pair of species having same percentage of carbon is:
(1) CH_3COOH and $C_6H_{12}O_6$
(2) CH_3COOH and C_2H_5OH
(3) $HCOOCH_3$ and $C_{12}H_{22}O_{11}$
(4) $C_6H_{12}O_6$ and $C_{12}H_{22}O_{11}$

Q88 The mass of solid residue produced by strong heating of 69 g of Ag_2CO_3 is:

$$2\,Ag_2\,CO_3\left(s\right) \xrightarrow{\Delta} 4\,Ag\left(s\right) + 2\,CO_2\left(g\right) + O_2\left(g\right)$$

[Given: Molar mass of Ag_2CO_3 = 276 g mol^{-1}]

(1) 108 g (2) 54 g
(3) 216 g (4) 81 g

Q89 Which of the following option is **not** correct.
(1) Leading zeros are not significant.
(2) Trailing zeros in a decimal number are significant.
(3) All exact numbers have infinite significant figures.
(4) Significant figures indicate accuracy.

Q90 How many molecules of O_2 will weigh equal to 10 molecules of CH_4?
(1) 10 (2) 5
(3) 15 (4) 8

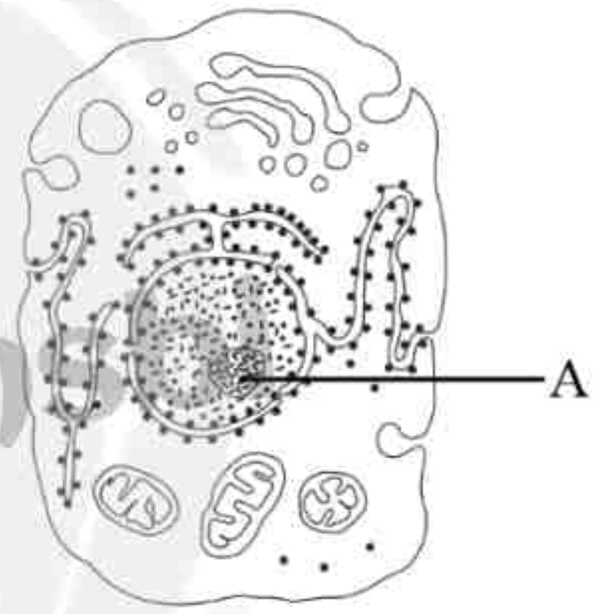
Q91 The cells stage in which cell remains metabolically active but no longer proliferate unless called on to do so is:
(1) G_1 phase. (2) G_2 phase.
(3) S phase. (4) G_0 phase.

Q92 The pili in bacteria:
(1) are round structures.
(2) made up of carbohydrate.
(3) are elongated tubular structures.
(4) helps in respiration.

Q93 Which of the following is **incorrect** about the microbodies?
(1) They are present in bacteria.
(2) They are minute membranous vesicles.
(3) They are present in plants and animals.
(4) They have various enzymes.

Q94 Identify the **incorrect** statement(s).
A. During metaphase I, bivalent chromosomes align on the equatorial plate.
B. By the end of diakinesis, the nucleolus appears.
C. During metaphase-I of meiosis, the spindle fibres attach to kinetochores of homologous chromosomes
(1) B and C (2) Only B
(3) A and C (4) Only C

Q95 Select the **correct** option w.r.t. labelled part A in the given figure.



(1) It is a membrane bound organelle
(2) It is the site of lipid synthesis
(3) It is more numerous in cells that are actively involved in protein synthesis
(4) It contains 70S ribosomes

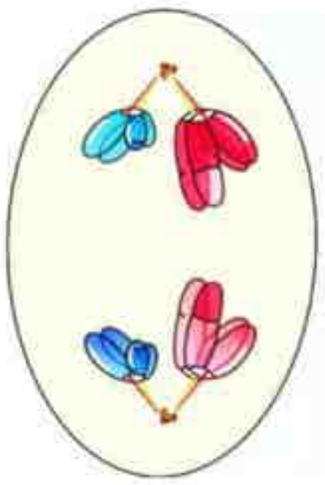
Q96 Select the **correct** statement(s):
(A) Tetrad are more clearly visible at the immediate next stage of leptotene.
(B) Involvement of recombinase enzyme during process of crossing over can be seen during the third stage of prophase I.
(C) Mitosis involves two sequential cycles of nuclear and cell divisions.
(D) Cell growth results in disturbing the ratio between the nucleus and the cytoplasm.
Choose the **correct** answer from the options given below:

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

Q97 The synthesis of lipid like hormones in animal cells occurs in:
(1) SER
(2) RER
(3) Golgi apparatus
(4) Mitochondria

Q98 Select the **correct** statement w.r.t mitosis.
(1) Amount of DNA in the parent cell is first halved and then distributed into two daughter cells.
(2) Amount of DNA in the parent cell is first doubled and then distributed into two daughter cells.
(3) Amount of DNA in the parent cell is first halved and then distributed into four daughter cells.
(4) Amount of DNA in the parent cell is first doubled and then distributed into four daughter cells.

Q99 Identify the **correct** stage of cell division shown in the following diagram.



(1) Prophase-I
(2) Metaphase-I
(3) Anaphase-I
(4) Telophase-I

Q100 Match **List-I** with **List-II.**

List-I (Scientists)		**List-II (Discovery)**	
(A)	Anton Von Leeuwenhoek	(I)	First saw and described a living cell
(B)	Robert Brown	(II)	The presence of cell wall is unique to plant cells
(C)	Theodore Schwann	(III)	Discovered the nucleus
(D)	Matthias Schleiden	(IV)	All plants are composed of different kinds of cells

Choose the **correct** answer from the option given below:
(1) A-I, B-III, C-IV, D-II
(2) A-I, B-III, C-II, D-IV
(3) A-III, B-I, C-IV, D-II
(4) A-I, B-IV, C-II, D-III

Q101 Identify the organism in which haploid cells divide by mitosis.
(1) Female honeybee
(2) Male honeybee
(3) Yeast
(4) Human

Q102 The central proteinaceous part of proximal region of the centriole is called:
(1) radial spoke.
(2) hub.
(3) central sheath.
(4) axoneme.

Q103 _____ marks the end of the cell division.
(1) Formation of metaphasic plate
(2) Division of nucleus into two daughter nuclei
(3) Reappearance of Golgi bodies in the cells
(4) Division of cytoplasm into two daughter cells

Q104 Identify the **correct** statements from the following.
A. Chlorophyll pigments are present in the thylakoids.
B. The membrane of the thylakoids of chloroplast encloses a space called a lumen.
C. Like mitochondria, the chloroplasts are also single membrane bound.

D. The space limited by the inner membrane of the chloroplast is called the stroma.

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

Q105 Starting of metaphase is marked by;
(1) Complete disintegration of nuclear envelope
(2) Disappearance of ER, GB, nucleolus and nuclear envelope
(3) Initiation of condensation of chromosomal material
(4) Alignment of chromosomes at the equatorial plate

Q106 Read the following statements about cell division and select the **correct** ones.
A. M phase represents the phase when actual cell division occurs and interphase represents the phase between two successive M phases.
B. In the 24 hours average duration of cell cycle of a human cell, cell division proper lasts for only about an hour.
C. M phase constitutes more than 10% of the duration of cell cycle.
(1) A and B (2) B and C
(3) A and C (4) A, B and C

Q107 Which of the following statements is **correct**?
(1) All animals and plants can show mitotic divisions in both haploid and diploid cells.
(2) After S phase the number of chromosomes becomes double i.e., 2n to 4n.
(3) During the G_2 phase, proteins are synthesised in preparation for mitosis while cell growth continues.
(4) S or synthesis phase marks the period during which RNA synthesis takes place.

Q108 A metacentric chromosome has:
(1) unequal arms.
(2) only one arm.
(3) terminal centromere.
(4) middle centromere.

Q109 Identify the **correct** statements from the following.
A. Cell-plate formed during cytokinesis represents the middle lamella.
B. In plant cells, wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls.
C. A very significant contribution of meiosis is cell repair.
D. Mitotic divisions in the meristematic tissues – the apical and the lateral cambium, result in a continuous growth of plants throughout their life.
Choose the most appropriate answer from the options given below:
(1) A and C only
(2) A, B and D only
(3) B and D only
(4) All A, B, C and D

Q110 Coccus and vibrio bacteria are:
(1) spherical and rod shaped respectively.
(2) rod and comma shaped respectively.
(3) spherical and comma shaped respectively.
(4) comma and spherical shaped respectively.

Q111 How many of the following can be observed in plant cell undergoing mitosis.

Cell plate formation, aster formation, centriole duplication, organelle duplication, synapsis.

(1) Two only (2) Three only
(3) Four only (4) Five only

Q112 _____ is a layer mainly made up of calcium pectate which holds or glues the different neighbouring cells together.
(1) Primary cell wall
(2) Cell membrane
(3) Glycocalyx
(4) Middle lamella

Q113 Consider the following statements about Prophase I of meiosis.
A. Compaction of chromosomes is initiated and continues through leptotene.
B. Synapsis, the pairing of homologous chromosomes, occurs during zygotene.

C. The exchange of genetic material occurs during diplotene.
D. Terminalisation of chiasmata is a characteristic feature of diakinesis.
Which of the above statements are **correct**?
(1) A, B, and D (2) A, C, and D
(3) B and C only (4) A, B, C, and D

Q114 Which is mismatched pair?
(1) Capsule – Thick and tough glycocalyx
(2) Slime layer – Loose glycocalyx
(3) Pili – Motility organ
(4) Bacterial cells – Motile or nonmotile

Q115 In anaphase I, each chromosome is composed of:
(1) one chromatid.
(2) two chromatids.
(3) four chromatids.
(4) many chromatids.

Q116 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: The prokaryotic flagella are structurally different from that of the eukaryotic flagella.
Reason R: In both prokaryotes and eukaryotes, the structure of flagella gives a cartwheel appearance.
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.

Q117 Identify the **correct** statement(s) from the following.
I. Gametes are formed from specialised diploid cells.
II. Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms.
III. The fertilisation restores the diploid phase.
IV. Meiosis is the mechanism by which conservation of specific chromosome number of each species is achieved across generations in asexually reproducing organisms.
Choose the most appropriate answer from the options given below.
(1) I and IV only
(2) I and III only
(3) I ,II and III only
(4) All I, II, III and IV

Q118 Choose the feature which is common in mitochondria, chloroplast, and prokaryotic cell?
(1) Single stranded DNA
(2) Presence of 70S ribosomes
(3) Absence of enzymes
(4) Surrounded by rigid cell wall

Q119 Identify the **incorrect** statements about G_0 phase.
A. This stage is also called quiescent stage.
B. These cells have exited from the G_2 phase of the cell cycle.
C. Heart cells generally remain in this stage.
D. Cells in this stage can proliferate when conditions require replacing cells that have been lost due to injury or cell death.
E. Cells in this stage remain metabolically active.
Choose the correct answer from the options given below:
(1) A, B, C and E only
(2) B only
(3) A and B only
(4) All except B

Q120 How many of the following is/are the function(s) of cell wall?
(a) Gives shape to the cells
(b) Protects from mechanical damage and infection
(c) Regulates the transport of the molecules across it
(d) Helps in cell to cell interaction
(1) One (2) Two
(3) Three (4) Four

Q121 Match **List-I** with **List-II**.

List-I		List-II	
(A)	Centromere	(I)	Basic proteins involved in chromatin formation
(B)	Kinetochores	(II)	Primary constriction of the chromosome
(C)	Satellite	(III)	Disc shaped structures on the sides of the centromere
(D)	Histones	(IV)	Small fragment beyond secondary constriction of chromosomes

Choose the **correct** answer from the options given below:

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

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

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

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

Q122 How many of the following is/are **incorrect?**

A. Prophase – Nucleolus, Golgi complex degenerate

B. S Phase– Duplication phase

C. G_1 Phase – Metabolically inactive

D. Telophase- Nucleolus, Golgi complex reform

Choose the most appropriate answer from the options given below:

(1) One (2) Two

(3) Three (4) Four

Q123 Read the following statements regarding endoplasmic reticulum (ER) and select the **correct** statement.

(1) ER divides the intracellular space into two distinct compartments.

(2) In plant cells steroidal hormones are synthesised in smooth endoplasmic reticulum.

(3) It is a reticulum of very large tubular structures scattered in the cytoplasm.

(4) In the presence of ribosome surface of ER appears smooth.

Q124 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Interkinesis and interphase involve increase in the amount of acidic genetic material lying in the cytoplasm of protist.

Reason R: . During S phase DNA content increases to double the initial amount of DNA present in parent cell.

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.

Q125 Identify the **correct** statements.

A. The matrix of mitochondria does not contain the components required for the synthesis of proteins.

B. Reserve materials in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies.

C. The cisternae of Golgi bodies are concentrically arranged near the nucleus.

D. Vacuoles contain water, sap, excretory product and other materials not useful for the cell.

Choose the most appropriate answer from the options given below:

(1) B and D only

(2) B, C and D only

(3) A and C only

(4) A, B and D only

Q126 Match **List-I** with **List-II**.

List-I		List-II	
(A)	Pachytene	(I)	Splitting of the centromere of each chromosome
(B)	Anaphase I	(II)	Homologous chromosome separation

(C)	Diplotene	(III)	Appearance of recombination nodules
(D)	Anaphase II	(IV)	Dissolution of the synaptonemal complex

Choose the **correct** answer from the options given below:

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

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

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

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

Q127 Identify from the following organelles which is/are **not** having double membrane.

A. Vacuole

B. Mitochondria

C. Lysosomes

D Endoplasmic reticulum

Choose the most appropriate answer from the options given below:

(1) A, B and D only

(2) B only

(3) B, C and D only

(4) All except B

Q128 Given below are two statements:

Statement I: The cells of the upper layer of the epidermis, cells of the lining of the gut, and blood cells are being constantly replaced by mitosis.

Statement II: Mitotic divisions occurs in the meristematic tissues of the plants.

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.

Q129 Given below are two statements:

Statement I: The Golgi cisternae are concentrically arranged near the nucleus with distinct concave *cis* or the forming face and convex *trans* or the maturing face.

Statement II: Majority of the chloroplasts of the green plants are found in the mesophyll cells of the leaves.

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.

Q130 The Ramachandran plot is mainly related to:

(1) DNA structure

(2) Protein conformation

(3) Lipid organisation

(4) RNA synthesis

Q131 Meiosis II is similar to mitosis, but not an exact copy of mitosis because

(1) It always occurs in diploid cells

(2) There is no DNA replication just prior to meiosis II

(3) Daughter cells, formed after meiosis II are similar to parent cell

(4) It is reductional division phase of meiosis

Q132 Read the following statements and select the **incorrect** one(s) w.r.t plasma membrane.

A. Plasma membrane is mainly composed of lipids and fats.

B. The major lipids are phospholipids.

C. Polar heads are hydrophobic arranged towards outer side.

D. Non polar tails are hydrophilic arranged towards inner side.

Choose the most appropriate answer from the options given below:

(1) B and C only

(2) A and B only

(3) A, C and D only

(4) All A, B, C and D

Q133 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: Meiosis increases the genetic variability in the population of organisms from one generation to the next.

Reason R: Meiosis involves pairing of homologous chromosomes and recombination between them.

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.

Q134 Read the following and identify the number of **incorrect** statement(s).

A. In plants, food vacuoles are formed by engulfing the food particles.

B. In plant cells the vacuoles can occupy up to 90 per cent of the volume of the cell.

C. Mitochondria, unless specifically stained, are not easily visible under the microscope.

D. The number of mitochondria per cell is variable depending on the physiological activity of the cells.

(1) 1 (2) 2

(3) 3 (4) 4

Q135 Identify the **incorrect** statement from the options given below.

(1) The stage between the two meiotic divisions is called interkinesis and is generally short lived.

(2) Diplotene can last for months or years in oocytes of some vertebrates.

(3) Karyokinesis in meiosis II ends with telophase II.

(4) Mitosis is usually restricted to the haploid cells only.

Q136 Germinal epithelium of testis and ovary is made up of:

(1) Columnar epithelium

(2) Squamous epithelium

(3) Cuboidal epithelium

(4) Stratified epithelium

Q137 Which of the following is **not** true for muscle fibres associated with biceps?

(1) Multinucleated in appearance

(2) Striated in nature

(3) Extensively branched in appearance

(4) Voluntary in nature

Q138 Given below are two statements.

Statement-I: The female frog possesses vocal sacs.

Statement-II: Vocal sacs are absent in male frogs.

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

(1) Statement I and Statement II both are correct.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Statement I and Statement II both are incorrect.

Q139 Select the **incorrect** statement from the following w.r.t frogs:

(1) Frogs have well organised male and female reproductive systems.

(2) External ear is absent in frogs and only tympanum can be seen externally.

(3) The hindbrain is characterised by a pair of optic lobes.

(4) The circulation of blood is achieved by the pumping action of the muscular heart.

Q140 Given below are two statements:

Statement I: In frogs, dissolved oxygen in water is exchanged through skin by diffusion.

Statement II: Frogs respire on land and in the water by two different methods.

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.

Q141 In cockroaches, the head is formed by the fusion of:

(1) five segments.

(2) four segments.

(3) eight segments.

(4) six segments.

Q142 Which of the following statements is **incorrect** w.r.t *Rana tigrina*?

(1) Brain is enclosed in a bony structure called brain box.

(2) Frogs do not have renal portal system.

(3) The lungs of frogs are a pair of elongated, pink coloured sac-like structures.

(4) Male frogs have copulatory pads.

Q143 In humans, Which of the following tissue forms exocrine glands?

(1) Muscular tissue.

(2) Nervous tissue.

(3) Epithelial tissue.

(4) Connective tissue.

Q144 Which of the following features is used to identify a male cockroach from a female cockroach?

(1) Presence of a boat shaped sternum on the 9^{th} abdominal segment

(2) Presence of caudal styles

(3) Forewings with darker tegmina

(4) Presence of anal cerci

Q145 Read the following statements **(I-V)** regarding the digestive system of the Periplaneta americana .

I. The crop is used for storing food.

II. The gizzard has an outer layer of thick circular muscles and a thick inner cuticle forming six highly chitinous plates called teeth.

III. A ring of 100-150 blind tubules called hepatic caeca is present at the junction of foregut and midgut.

IV. The hindgut is broader than the midgut and is differentiated into ileum, colon, and rectum.

V. The entire foregut is lined by cuticle.

How many of the above statements are **correct**?

(1) Two (2) Three

(3) Four (4) Five

Q146 Consider the following statements w.r.t vascular system of frog.

I. The vascular system of frog is open type.

II. Blood vascular system includes heart, blood and blood vessels.

III. Frogs do not have a lymphatic system.

IV. Heart of frog is situated in the upper part of the body cavity.

V. Sinus venosus joins the left atrium.

Which of the above statement/s is/are **correct**?

(1) III and V only (2) II and IV only

(3) I and IV only (4) I and II only

Q147 Select the **correct** statement w.r.t. *Periplaneta americana.*

(1) On an average females produce 14-16 oothecae, each containing 9-10 eggs.

(2) A pair of spermatheca is present in the 6^{th} segment of only female cockroach.

(3) Anal styles present exclusively in females.

(4) Mesothoracic wings are opaque, dark and leathery in appearance and are used in flight.

Q148 ___(A)___ attaches skeletal muscles to bones and ___(B)___ attaches one bone to another bone.

Choose the option that **correctly** fill the blanks **A** and **B**, respectively.

(1) A- Tendon, B- ligament

(2) A- Ligament, B- tendon

(3) A- Collagen fibres, B- tendon

(4) A- Elastin fibres, B- ligament

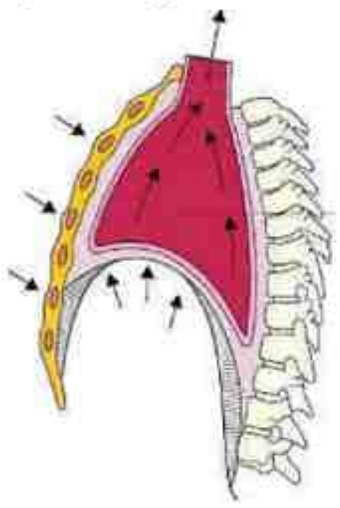
Q149 Male frog can be distinguished from female frog by the presence of
(1) vocal sacs and copulatory pad on the first digit of the forelimb
(2) a neck and tail is absent
(3) the hindlimb ends in the five digits
(4) eyes are bulged and covered by the nictitating membrane

Q150 Which of the following statements regarding animal tissues is **incorrect**?
(1) Compound epithelium covers the dry surface of the skin and the moist surface of the buccal cavity and has a limited role in secretion and absorption.
(2) In dense regular connective tissue, the collagen fibres are present in rows between many parallel bundles of fibres.
(3) Adhering junctions help to stop substances from leaking across a tissue.
(4) The squamous epithelium with irregular boundaries is found in the walls of blood vessels and air sacs of lungs.

Q151 What percentage of O_2 is transported by RBCs in the blood?
(1) 3% (2) 97%
(3) 20-25% (4) 70%

Q152 The volume of CO_2 delivered by 100 ml of deoxygenated blood to the alveoli is;
(1) 4 ml. (2) 5 ml.
(3) 15 ml. (4) 20 ml.

Q153 Given below is the diagrammatic representation, explaining mechanism of breathing.



Choose the **correct** interpretation of the diagram;
(1) Diaphragm becomes dome shaped due to contraction of its muscles and decreases the volume of thoracic cavity.
(2) Volume of thoracic cavity decreases due to contraction of external intercostal muscles.
(3) Diaphragm is relaxed and arched upwards which decreases the volume of thoracic cavity.
(4) Contraction of external intercostal muscle shifts the ribs inwards and downwards.

Q154 Which of the following set of conditions in alveoli is most favourable for the formation of oxyhaemoglobin?
(1) Low pO_2, high pCO_2, high H^+ concentration, high temperature
(2) High pO_2, low pCO_2, low H^+ concentration, low temperature
(3) Low pO_2, low pCO_2, high H^+ concentration, high temperature
(4) High pO_2, high pCO_2, low H^+ concentration, high temperature

Q155 Which of the following statement/s is/are **incorrect**?
A. In alveoli, partial pressure of oxygen is higher which is favourable for oxyheamoglobin formation.
B. Pulmonary ventilation involves diffusion of gases between blood and tissue.
C. In emphysema, alveolar walls are damaged.
(1) A and C only
(2) A, B and C
(3) B only
(4) A only

Q156 The urge to inhale in humans results from:
(1) falling pO_2. (2) rising pO_2.
(3) falling pCO_2. (4) rising pCO_2.

Q157 Match **List-I** with **List-II**.

List-I		List-II	
(A)	TV	(I)	1200 ml
(B)	IRV	(II)	3000 ml
(C)	ERV	(III)	500 ml

(D)	RV	(IV)	1100 ml

Choose the **correct** answer from the options given below:

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

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

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

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

Q158 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: Human have one pair of lungs.

Reason R: The branching network of bronchi, bronchioles and alveoli comprise the lungs.

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.

Q159 Select the **incorrect** statement regarding the transport of gases in human blood.

(1) Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2.

(2) RBCs contain a very high concentration of the enzyme carbonic anhydrase and minute quantities of the same are present in the plasma.

(3) Every 100 ml of deoxygenated blood delivers approximately 5 ml of CO_2 to the alveoli.

(4) The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

Q160 Volume of air that will remain in the lungs after a normal expiration is;

(1) Expiratory capacity

(2) Functional residual capacity

(3) Vital capacity

(4) Total lung capacity

Q161 Inspiration occurs when intra pulmonary pressure is;

(1) higher than atmospheric pressure.

(2) lower than atmospheric pressure.

(3) equal to atmospheric pressure.

(4) Both (2) and (3)

Q162 Which of the following best describes the physiological cause of breathing difficulty and wheezing observed in bronchial asthma?

(1) proliferation of fibrous tissue.

(2) inflammation of bronchi and bronchioles.

(3) damaged alveolar walls.

(4) fluid filled in alveolar cavity.

Q163 Which of the following shows the **correct** sequence of passage of air in the body?

(1) External nostrils → nasal chamber → pharynx → larynx → trachea → bronchi → bronchioles → alveoli

(2) Nasal chamber → external nostril → larynx → pharynx → trachea → bronchioles → bronchi → alveoli

(3) Nasal chamber → external nostrils → larynx → pharynx → trachea → bronchi → bronchioles → alveoli

(4) Nasal chamber → external nostril → larynx → trachea → pharynx → bronchioles → bronchi → alveoli

Q164 Contraction of diaphragm results in;

(1) increase in the volume of thoracic chamber in antero-posterior axis.

(2) increase in the volume of thoracic chamber in dorso-ventral axis.

(3) decrease in the volume of thoracic chamber in antero-posterior axis.

(4) decrease in the volume of thoracic chamber in dorso-ventral axis.

Q165 Given below are two statements:

Statement I: The lungs are situated in the thoracic chamber which is anatomically an air tight chamber.

Statement II: Pressure contributed by an individual gas in a mixture of gases is called partial pressure.

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

below:
(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect

Q166 A decrease in plasma albumin levels is likely to affect
(1) Clot formation
(2) Oxygenation of haemoglobin
(3) Osmotic balance
(4) Immune functions

Q167 Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?
A. They do not need to reproduce.
B. They are somatic cells.
C. They do not metabolise.
D. All their internal space is available for oxygen transport.
(1) Only D (2) Only A
(3) A, C and D (4) B and C

Q168 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: A healthy individual has 12-16g of haemoglobin in every 1000 ml of blood.
Reason R: Haemoglobin molecules play a significant role in transport of respiratory gases like oxygen.
In the light of the above statements, choose the correct answer from the options given below:
(1) Both A and R are true and R is the correct explanation of A.
(2) Both A and R are true but R is NOT the correct explanation of A.
(3) A is true but R is false.
(4) A is false but R is true

Q169 Which type of white blood cells are concerned with the release of histamine and the natural anticoagulant heparin?
(1) Eosinophils (2) Monocytes
(3) Neutrophils (4) Basophils

Q170 A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?
(1) Blood group B
(2) Blood group AB
(3) Blood group O
(4) Blood group A

Q171 Read the following statements.
Assertion (A): AB blood group is a 'universal acceptor'.
Reason (R): A person with AB blood group has no antibodies against antigen A and B in its plasma.
Mark the correct choice as:
(1) If both Assertion (A) and Reason (R) are true and the Reason (R) is a correct explanation of the Assertion (A).
(2) If both Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of the Assertion (A).
(3) If Assertion (A) is true but the Reason (R) is false.
(4) If Assertion (A) is false but the Reason (R) is true.

Q172 What is the primary cause of erythroblastosis foetalis?
(1) Incompatibility between the mother's and father's blood types
(2) Exposure to certain infections during pregnancy
(3) Genetic mutation in the foetus
(4) Maternal malnutrition during pregnancy

Q173 Match the items given in List-I with those in List-II and select the correct option given below.

List-I		List-II	
A.	Fibrinogen	P.	Osmotic balance
B.	Globulin	Q.	Blood clotting
C.	Albumin	R.	Defense mechanism

(1) A-(R) B-(Q) C-(P)
(2) A-(P) B-(Q) C-(R)
(3) A-(P) B-(R) C-(Q)
(4) A-(Q) B-(R) C-(P)

Q174 Given below are two statements.
Statement-I: Blood plasma along with the clotting factors is called serum.
Statement-II: A healthy adult man has, on an average, 5 millions to 5.5 millions of RBCs mm^{-3} of blood.
In the light of the above statements, choose the most appropriate answer from the options given below.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct, but Statement II is incorrect.
(3) Statement I is incorrect, but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

Q175 Read the statements given below and choose the **correct** sequence of events leading to the formation of a blood clot.
(I) Calcium activates enzyme.
(II) Fibrin binds platelets to form a 'plug'.
(III) Thrombin converts fibrinogen to fibrin.
(IV) Platelets and damaged cells release an activator.
(1) I → II → III → IV
(2) IV→ III→ I → II
(3) IV → I → III → II
(4) III → IV → II → I

Q176 Which of the following statements is/are incorrect about the lymph.
I. Lymph is a red coloured fluid containing large proteins and formed elements.
II. It is also called tissue fluid which leaks out through capillaries into tissue spaces.
III. It contains specialised lymphocytes which are responsible for the immunity of the body.
IV. Lymph is an important carrier for nutrients and hormones.
V. Fats are absorbed through the lymph in the lacteals present in the intestinal villi.
Choose the correct option.
(1) Only I (2) III and IV
(3) II and III (4) Only IV

Q177 Given below are two statements.
Statement I: In open type of circulatory system, there are no blood capillaries and the blood flows in the body cavity.
Statement II: The open type of circulatory system is common in arthropods and molluscs.
In the light of the above statements, choose the most appropriate answer from the options given below.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct, but Statement II is incorrect.
(3) Statement I is incorrect, but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

Q178 Why do birds and mammals have double circulation?
(1) To ensure that oxygenated and deoxygenated blood mix together
(2) To allow for efficient exchange of gases in the lungs
(3) To maintain separate circulatory pathways for oxygenated and deoxygenated blood
(4) To increase the speed of blood flow in the body

Q179 Given below are two statements.
Statement I: The pulmonary circulation starts by the pumping of oxygenated blood by the right ventricle which is carried to the lungs where it is oxygenated and returned to the left atrium.
Statement II: The systemic circulation starts with the pumping of oxygenated blood by the left

ventricle through the aorta which is carried to all the body tissues and the deoxygenated blood from there is collected by the veins and returned to the right atrium.

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

(1) Statement I and Statement II both are correct.

(2) Statement I is correct, but Statement II is incorrect.

(3) Statement I is incorrect, but Statement II is correct.

(4) Statement I and Statement II both are incorrect.

Q180 X is present in our body exclusively for the circulation of blood to and from the cardiac musculature. Identify X.

(1) Coronary arteries

(2) Coronary veins

(3) Coronary circulation

(4) Portal circulation

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