



MEGA
ResoFAST 2025

Resonance Future Achievers Scholarship Test

TEST PAPER

Duration
1 Hour

Currently Studying in
Class-X(NEET)

Max. Marks
160

Important Instructions to the Students

1. The question paper contains a total of **40 Multiple Choice Questions**, numbered from **Q1 to Q40**.

2. **Pattern & Marking Scheme of each section:**

Parts	Subject	No. of questions	Questions Range	Marks
Part-A	Physics	10	Q1 to Q10	40 M
Part-B	Chemistry	10	Q11 to Q20	40 M
Part-C	Mathematics	05	Q21 to Q25	20 M
Part-D	Biology	15	Q26 to Q40	60 M
Total		40	Q1 to Q40	160 M

3. Attempt all questions, each having only one correct answer.

4. Each question carries **4 marks**.

5. Candidates must ensure that the **OMR Sheet is not folded or damaged** in any way. Avoid making any **stray marks** on the OMR sheet. **Do not** write your **Roll Number** anywhere except in the designated space provided in the OMR Sheet.

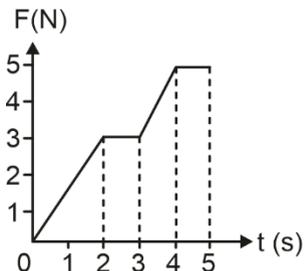
6. The use of **white correction fluid** is **strictly prohibited** on the OMR Sheet.

7. The use of **blank papers, clipboards, log tables, slide rules, calculators, mobile phones, or any other electronic gadgets** is **strictly not permitted** inside the examination hall.

8. There is an empty page left at the end of this question paper for **rough work**.

1. Force-Time Mystery Ride

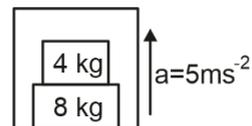
The initial speed of a body of mass 10 kg is 7 m s^{-1} , for 5 s. A force acts on the body in the direction of motion. The force time graph is shown in the figure. The speed of body at $t = 5 \text{ s}$ is:



- (A) 5.2 m s^{-1} (B) 8.5 m s^{-1}
 (C) 10.2 m s^{-1} (D) 13.1 m s^{-1}

2. Who Pushes Whom in the Lift?

Two blocks of mass 4 kg and 8 kg are kept in a lift accelerating upward with an acceleration of 5 ms^{-2} as shown in the given figure. Select the **incorrect** statement(s). (Take $g = 10 \text{ m/s}^2$)

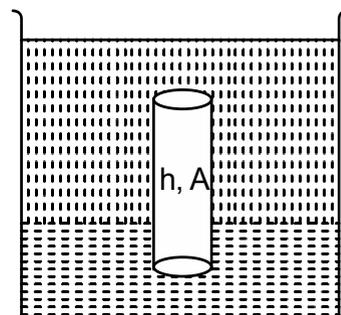


- (i) The normal force between block of mass 8 kg and floor of the lift is 180 N.
 (ii) The normal force between blocks of mass 8 kg and 4 kg is 80 N.
 (iii) Normal force is always perpendicular to the plane surface at the point of contact.

- (A) (i) and (ii) only (B) (ii) only (C) (i) and (iii) only (D) (ii) and (iii) only

3. The Floating Cylinder Secret

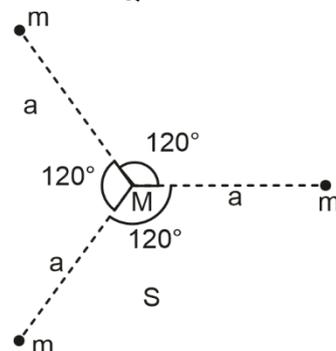
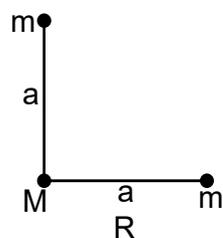
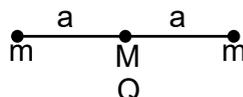
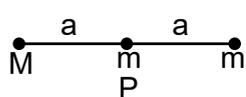
A solid cylinder of height h , cross sectional area A and density $1.40 \times 10^3 \text{ kg m}^{-3}$ is immersed completely in a mixture of liquid such that it floats with its axis vertical at the liquid-liquid interface with length $3h/4$ in lesser dense liquid as shown in the figure. The lesser dense liquid is open to atmospheric pressure P_0 . If the density of lesser dense liquid is $1.0 \times 10^3 \text{ kg m}^{-3}$, then the density of denser liquid will be



- (A) $1.5 \times 10^3 \text{ kg m}^{-3}$ (B) $2.0 \times 10^3 \text{ kg m}^{-3}$
 (C) $2.6 \times 10^3 \text{ kg m}^{-3}$ (D) $3.2 \times 10^3 \text{ kg m}^{-3}$

4. Gravitational Tug-of-War: Which Configuration Pulls M the Most?

Some identical particles of masses m , and one with mass ' M ' are arranged in four configurations as shown in the given figures.



Arrange the given configurations from greatest to least according to the magnitude of the gravitational force on M.

- (A) R, P, Q = S (B) P, Q, R, S (C) R, Q, P, S (D) P, R, Q, S

5. Who Explains What?

Match column I with column II and select the correct option from the given codes.

	Column I		Column II
P.	When a body does work against friction, its kinetic energy	(i)	Can be +ve or -ve or zero
Q.	Work done by a force	(ii)	Must be -ve
R.	Work done by static friction	(iii)	Force may be conservative
S.	When work done over a closed path is zero	(iv)	Decreases
		(v)	Force may be nonconservative

(A) P-(i), Q-(iv), R-(iii), S-(v)

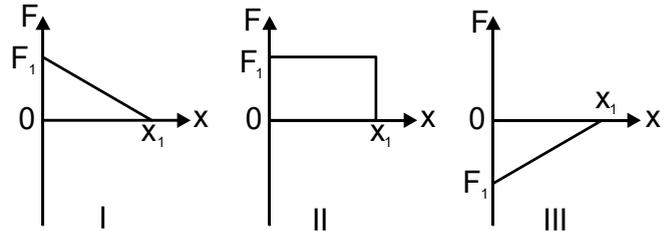
(B) P-(iv), Q-(i), R-(i), S-(iii)

(C) P-(ii), Q-(iii), R-(i), S-(v)

(D) P-(iv), Q-(ii), R-(i), S-(iii)

6. Where Does Energy Change Most?

For a particle moving along the positive x-axis from origin to $x = x_1$, the variation of the magnitude of force on the particle is depicted in the given graphs. The force is parallel to the x-axis and is conservative. The maximum magnitude of force F_1 has the same value for all the graphs.



On the basis of given graphs, which of the following statements are correct?

(i) The change in potential energy is maximum in graph II.

(ii) The change in potential energy is minimum in graph II.

(iii) The change in potential energy is greater in graph III as compared to graph I.

(iv) The change in potential energy is smaller in graph III as compared to graph I.

(A) (i) and (iii) only

(B) (iii) and (iv) only

(C) (ii) and (iii) only

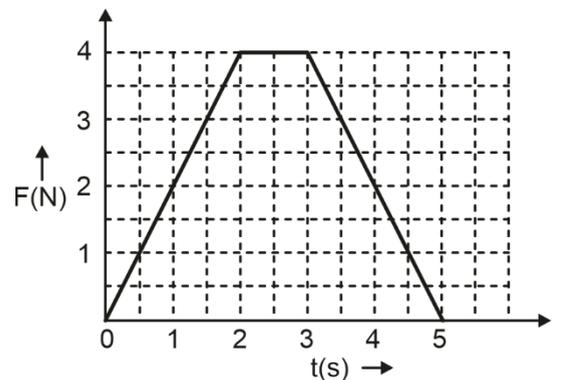
(D) (ii) and (iv) only

7. Impulse on a Particle!

The given graph represents the variation of magnitude of net force (F) exerted in x direction on a 2.50 kg particle with time. On the basis of given graph, fill in the blanks by selecting the correct option, from $t = 0$ to $t = 5$ seconds.

The impulse of the force is (i) kg m s^{-1} . Final velocity of the particle, if it is originally at rest is (ii) ms^{-1} . Its final velocity if its original velocity is -2.0 m s^{-1} , is (iii) ms^{-1} .

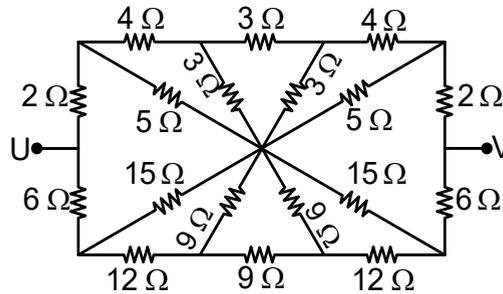
The average force exerted on the particle for the time interval 0 to 5 s is (iv) N.



	(i)	(ii)	(iii)	(iv)
(A)	12	2.8	2.4	4.8
(B)	6	2.4	2.8	4.8
(C)	12	4.8	2.8	2.4
(D)	24	4.8	2.4	2.8

8. **Electrons Lost in a Maze**

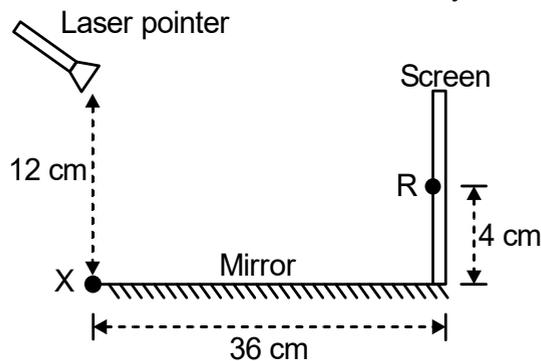
What will be the value of equivalent resistance between U and V in the given circuit?



- (A) 13Ω (B) 6.75Ω (C) 12Ω (D) 42.3Ω

9. **Laser Bounce Challenge**

The ray from a laser pointer hits a plane mirror and the reflected ray strikes a screen. How far away from point X should the ray strike the mirror to cause the reflected ray to hit point R ?



- (A) 6 cm (B) 27 cm (C) 15 cm (D) 18 cm

10. **The Max Speed of the Journey**

A car accelerates from rest at constant rate α for some time and then decelerates at a constant rate β to come to rest. The total time elapsed is t . Which one of the following options represents the maximum velocity attained by the car and distance travelled by the car?

	Maximum velocity attained by the car	Distance travelled by the car
(A)	$\frac{\alpha\beta t}{\alpha + \beta}$	$\frac{2\alpha\beta t^2}{(\alpha + \beta)}$
(B)	$\frac{\alpha\beta t}{2(\alpha + \beta)}$	$\frac{\alpha\beta t^2}{\alpha + \beta}$
(C)	$\frac{\alpha\beta^2 t}{\alpha^2 + \beta^2}$	$\frac{\alpha\beta^2 t^2}{2(\alpha^2 + \beta^2)}$
(D)	$\frac{\alpha\beta t}{\alpha + \beta}$	$\frac{\alpha\beta t^2}{2(\alpha + \beta)}$

PART B - CHEMISTRY

11. **Yellow Solid Mystery**

In a chemistry lab, Manoj and Karthik were doing an experiment. During the process, they passed H_2S gas into a chamber of SO_2 gas, they suddenly noticed the formation of yellow colour solid and water. Can you help them to identify the type of reaction and Oxidant in the above reaction.

- (A) Decomposition, H_2O (B) Precipitation, H_2S
 (C) Precipitation, SO_2 (D) Displacement, H_2S

12. Isotopes in a Number Race

The X^- ion has 18 electrons and an atomic mass of 35.5. It has two isotopes, one is having 18 neutrons [X_1] and the other is having 20 neutrons [X_2]. Find the ratio of the availability of X_1 to X_2 respectively.

- (A) 4 : 3 (B) 1 : 2 (C) 2 : 3 (D) 3 : 1

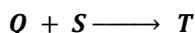
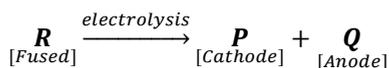
13. Pharmacolite Power Test

A chemical called pharmacolite [$CaHAsO_4 \cdot 2H_2O$] is used to identify the contamination of ground water. During the process if 2.5g of pharmacolite is used, how many hydrogen atoms are actually consumed in this activity? [Atomic mass: Ca-40, H-1, As-75, O-16]

- (A) 6.97×10^{21} (B) 2.09×10^{22} (C) 2.79×10^{22} (D) 3.48×10^{22}

14. Electrolysis Identity Hunt

Observe the reactions given below and identify **P**, **Q** and **T** correctly.

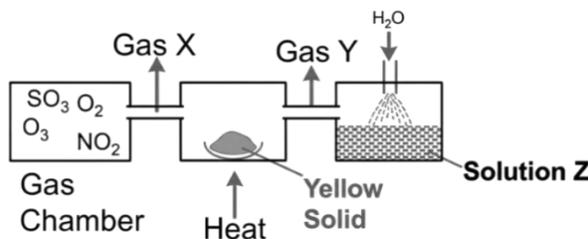


[Hint: **R** is used in freezing mixture and **S** is used for whitewash]

- (A) P- Cl_2 , Q- H_2 , T-HCl (B) P-Na, Q- Cl_2 , T- $CaOCl_2$
 (C) P- H_2 , Q- Cl_2 , T-NaCl (D) P-Ca, Q- Cl_2 , T- $CaOCl_2$

15. Spot the Colour-Changing Culprit

There are four gases present in a gas chamber, out of which one gas **X** diffuses into another chamber, where it reacts with an yellow colour solid and forms a product **Y** which further gets wet in another chamber and forms **Z**. If **Z** is treated with methyl orange the colour change would be:



- (A) Yellow (B) Red (C) Green (D) Blue

16. Who Dissolves the Most?

The solubility of four substances **P**, **Q**, **R**, **S** is given below:

Substance	Solute(gm)	Solvent(gm)
P	5	100
Q	18	50
R	25	100
S	75	150

Identify the descending order of mass percentage of the substances in the solution.

- (A) S > R > Q > P (B) P > Q > R > S (C) S > Q > R > P (D) Q > R > P > S

17. Climbing the Atomic Ladder

The quantum numbers for the valence electron of four elements **W**, **X**, **Y** and **Z** are given below.

Element	n	l	m	s
W	2	0	0	+1/2
X	3	1	-1	+1/2
Y	2	1	0	-1/2
Z	4	0	0	-1/2

Arrange the elements in increasing order of atomic number.

- (A) W, Y, X, Z (B) W, X, Y, Z (C) Z, X, Y, W (D) Y, W, X, Z

18. Valence Matchmaking!

The number of valence electrons in X and Y are 6 and 1 respectively. Give the correct formula of the compound formed when X combines with Hydrogen and Y combines with Oxygen.

- (A) HX, Y_2O (B) XH_2, YO (C) H_2X, Y_2O (D) XH, YO_2

19. Which Gas Fills More?

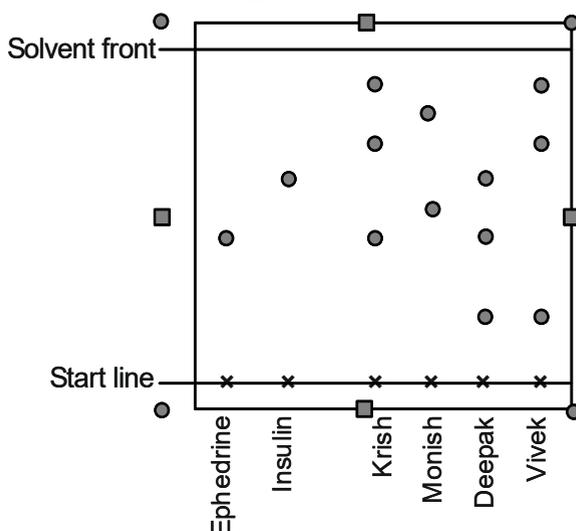
Which of the following gases occupy the maximum volume at STP?

- (A) 14g of N_2 (B) 1.7g of NH_3 (C) 80g of SO_3 (D) 10g of H_2

20. Chromatography Crime Scene

Use of drugs like ephedrine and insulin by athletes is banned.

Krish, Monish, Deepak and Vivek were asked by a trainer to give their urine samples for the tests. Chromatogram of their urine samples and drugs is shown below:



Study the given chromatogram carefully and choose the **incorrect** statement among the following.

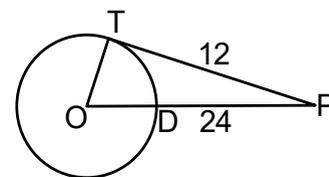
- (A) Deepak used both the drugs.
 (B) Krish and Deepak used insulin.
 (C) Krish used ephedrine.
 (D) Monish and Vivek did not use any of the given drugs.

PART C - MATHEMATICS

21. Arc Length Mystery

In the following figure it is given that $PT = 12$ & $PO = 24$, then length of arc \widehat{TD} is:

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



22. The Decimal Doom Test!

How many positive integers less than 100 have reciprocals that produce terminating decimal expansions?

- (A) 13 (B) 14 (C) 21 (D) 25

23. Roots That Rearrange

Let α and β be the roots of the equation $(x - a)(x - b) = c, c \neq 0$. Then the roots of the equation $(x - \alpha)(x - \beta) + c = 0$ are

- (A) a, c (B) b, c (C) a, b (D) $a + c, b + c$

24. The Polynomial Power Move

The leading coefficient of a polynomial $P(x)$ of degree 3 is 2025. Suppose that $P(1) = 5, P(2) = 7, P(3) = 9$, then find $P(4)$.

- (A) 11 (B) 9 (C) 7 (D) None of These

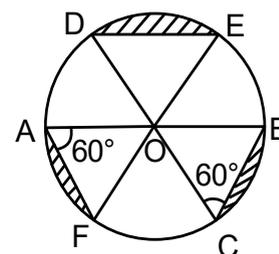
25. Six Slices, One Shaded Secret

In the adjoining figure **O** is the centre of the circle with radius **r**. **AB, CD** and **EF** are the diameters of the circle.

$\angle OAF = \angle OCB = 60^\circ$.

What is the area of the shaded region?

- (A) $\frac{r^2}{2} \left(\pi - \frac{3\sqrt{3}}{2} \right)$ (B) $\frac{r^2}{2} \left(\pi - \frac{3\sqrt{3}}{4} \right)$
 (C) $\frac{r^2}{3} \left(\pi - \frac{2\sqrt{3}}{3} \right)$ (D) Data insufficient



PART D - BIOLOGY

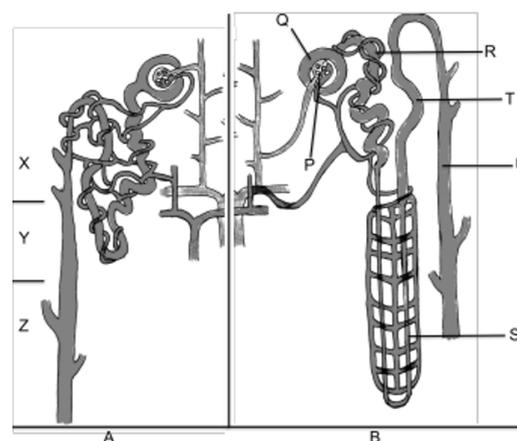
26. Which Nephron Wins?

The figure below represents two types of nephrons (labeled as A and B) observed in mammals.

A-Type A nephron; B-Type B nephron; P-Glomerulus; Q-Bowman's capsule; R-Proximal convoluted tubule; S-Loop of Henle; T-Distal convoluted tubule; U-Collecting duct; X-Cortex; Y Outer medulla; Z- Inner medulla

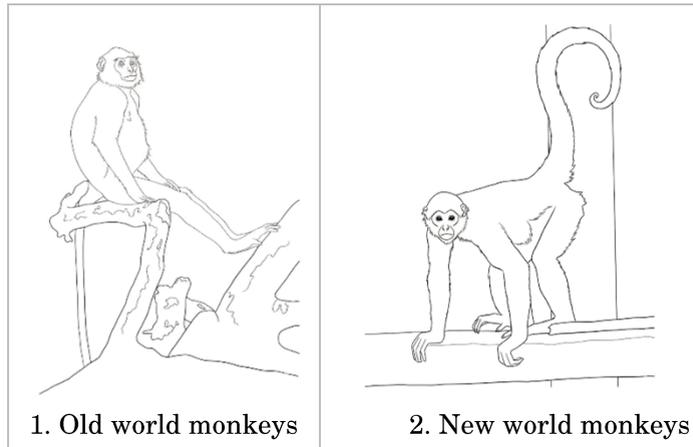
Which of the following statements regarding the nephrons is correct?

- (A) In comparison to type A nephron, the urine produced by a type B nephron is likely to be more concentrated
 (B) Type B nephron is likely to absorb more potassium ions as compared to type A nephron.
 (C) In comparison to type B nephron, in type A nephron, reabsorption of NaCl leads to subsequent osmosis of water from loop of Henle into the blood.
 (D) In comparison to type B nephron, type A nephron is likely to remove poisonous substances from the blood more efficiently.



27. From Africa to America!

A small population of monkeys from Africa (Old World) are thought to have drifted to South America (New World) on natural rafts about 40 million years ago. On reaching South America, these monkeys bred and over time looked very different from the monkeys in Africa. They formed new species.



Arrange the evolutionary processes that would lead to the formation of the new species.

- (A) Migration → Adaptation → Natural Selection
- (B) Genetic drift → Natural Selection → Adaptation
- (C) Natural Selection → Adaptation → Genetic drift
- (D) Adaptation → Genetic drift → Natural Selection

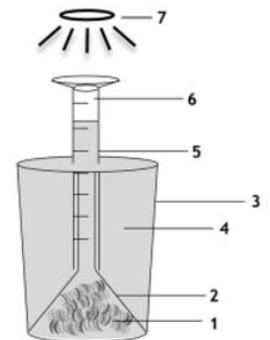
28. Your Immunity After COVID

A person is sick from the COVID-19 virus. What kind of immunity does this person gain due to the infection and then retain after recovery?

- (A) Active immunity, innate immunity
- (B) Active immunity, acquired immunity
- (C) Passive immunity, innate immunity
- (D) Passive immunity, acquired immunity

29. The Oxygen Trap Test

Water thyme (*Hydrilla* sp.) plants (1) are placed inside an upturned funnel (2) in a beaker (3) containing pond water (4) with a small amount of NaHCO_3 added. (5) The end of the funnel is covered with a measuring cylinder (6) in which air was trapped. (7) A light bulb is used as a light source.



Consider the following statements:

- I. If more NaHCO_3 is added to the water, more bubbles could be observed.
- II. If the light is changed from white to blue light at the same intensity, more bubbles could be observed.
- III. If the light is changed from white to green light at the same intensity, more bubbles could be observed.
- IV. After three hours of the experiment, the air inside the cylinder is mostly carbon dioxide.

Which statements (I-IV) are correct?

- (A) I only
- (B) I and II
- (C) II and III
- (D) II and IV

30. Where Does Carbon Go?

In which of the following direction does carbon dioxide move during internal respiration?

- (A) From the tissue cells into the blood (B) From the blood into the lungs
(C) From the lungs into the blood (D) From the blood into the tissue cells

31. The Heart's Blood Highway

Your blood alternates between your body's pulmonary circuit and systemic circuit through various vessels and chambers. Below is a list of vessels and structures that are associated with your heart. What is the correct order for the flow of blood entering from the systemic circulation?

1. Right atrium 2. Left atrium 3. Right ventricle 4. Left ventricle
5. Venae cava 6. Aorta 7. Pulmonary trunk 8. Pulmonary veins
(A) 1,7,3,8,2,4,6,5 (B) 1,2,7,8,3,4,6,5 (C) 5,1,3,8,7,2,4,6 (D) 5,1,3,7,8,2,4,6

32. Cardiac Output Surprise

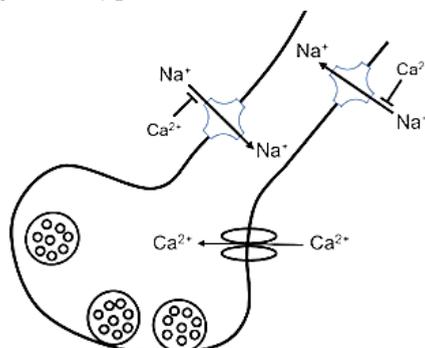
Daksha decided to go for a run. What change, if any, would you expect to see in cardiac output of her?

- (A) Increase (B) Decrease
(C) Increase initially and then decrease (D) Stay the same

33. Ion Trouble at the Nerve End

Movement of sodium and calcium ions at the nerve terminal end is shown.

Accordingly, which of the following options is the most accurate observation made from the nerve terminal of an individual suffering from hypercalcemia?



- (A) Increased depolarization as well as synaptic vesicle fusion causing hyper-excitability of neurons.
(B) Reduced depolarization and reduced synaptic vesicle fusion affecting muscle function.
(C) Normal depolarization but enhanced synaptic vesicle fusion causing muscle weakness.
(D) Increased depolarization, normal synaptic vesicle fusion leading to unperturbed muscle functions.

34. Sons, Daughters... or Both?

Hereditary afflictions that are X-linked recessive mainly affect:

- (A) Daughters (B) Sons (C) Granddaughters (D) Grandsons

35. The Spread-Factor Question

Communicable disease is best described as:

- (A) Diseases that are passed from cell to cell
(B) Diseases that are spread from one person or organism to another
(C) Diseases that lie dormant in the community
(D) Diseases that are seasonal

36. Roots, Tips, and Auxin

Which of the statement/s is/are true?

- I. At low concentrations, auxin stimulates the root cap to elongate.
- II. The effects of auxin are confined to the regions in which it is synthesized.
- III. Auxin stimulates gravitropism in roots.
- IV. Auxin is transported through the plant in an active, cell-to-cell manner.

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

37. The Pathogen Line-Up

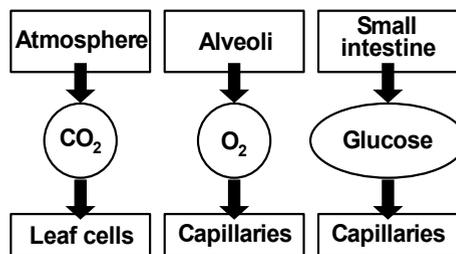
Which of the following may be pathogenic organisms?

- I. Bacteria II. Viruses III. Prions IV. Fungi V. Protozoa

- (A) I and II (B) I, II and V (C) I, IV and V (D) I, II, IV and V

38. Same Process, Three Scenes

The diagram below shows examples of directional movement of substances.



Which process is taking place in all three examples?

- (A) Absorption (B) Assimilation (C) Diffusion (D) Osmosis

39. Name That Animal Tissue!

Given below is the diagrammatic representation of a type of animal tissue 'X'. Identify the tissue and select the correct statement regarding it.

- (A) It is a dense connective tissue that stores fat and insulates the body against heat loss.
- (B) It is a loose connective tissue that acts as packing and supporting tissue between organs lying in the body cavity.
- (C) It is a loose connective tissue that connects skeletal muscles to bones.
- (D) It is a dense connective tissue that is found beneath the skin and covering of the heart.



Tissue X

40. Fight-or-Flight vs Salt Balance

Refer to the diagram showing organ X of the human body and read the following paragraph.

Organ X secretes two hormones P and Q. P prepares our body to function at maximum efficiency during emergency situations whereas Q maintains the correct salt balance in the blood.

Identify P and Q and select the correct option.

- (A) P-Aldosterone, Q – Thyroxine (B) P-Adrenaline, Q - Aldosterone
- (C) P - Insulin, Q – Adrenaline (D) P-Thyroxine, Q - Adrenaline

