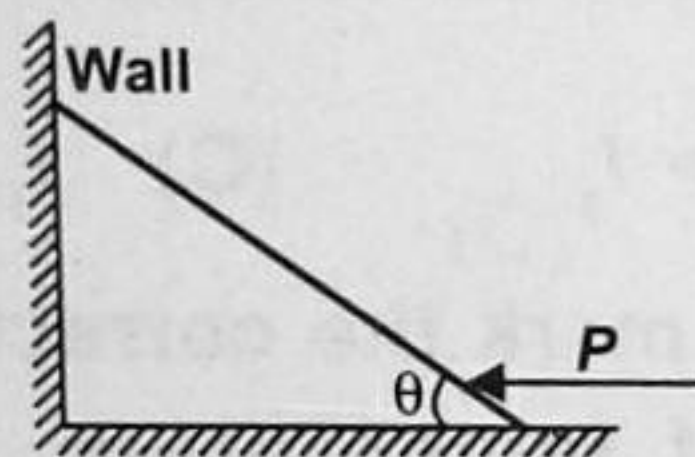


SECTION-1

PHYSICS

1. Assuming frictionless contacts, then the magnitude of external horizontal force P applied at the lower end for equilibrium of the rod will be (The rod is uniform and its mass is m)



- (A) $\frac{mg}{2}$ (B) $\frac{mg}{2} \cot \theta$ (C) $\frac{mg}{2} \tan \theta$ (D) $\frac{mg}{2} \sec \theta$

2. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I

- (a) Power of convex lens
(b) Power of concave lens
(c) Power of plane mirror

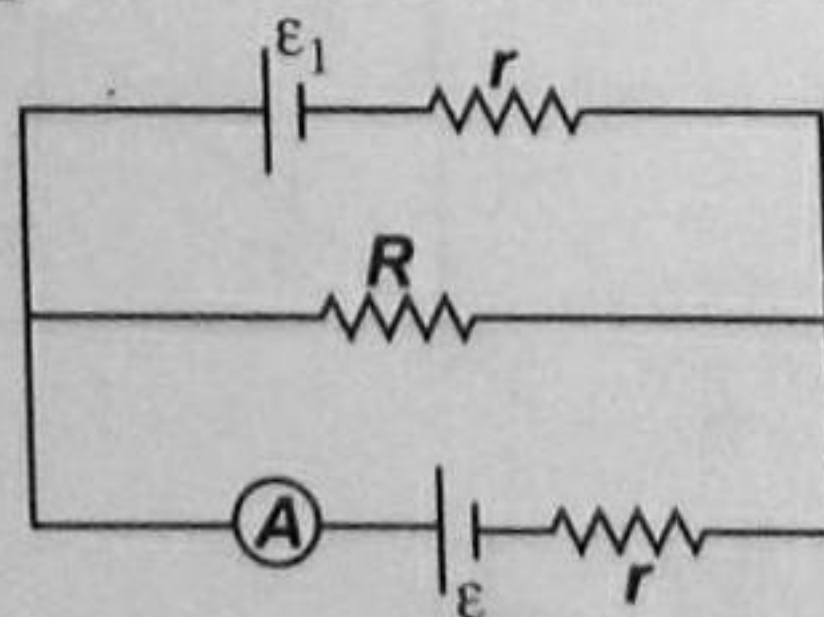
- (A) (a) – (i), (b) – (iii), (c) – (ii)
(C) (a) – (ii), (b) – (i), (c) – (iii)

Column-II

- (i) Positive power
(ii) Negative power
(iii) Infinite power

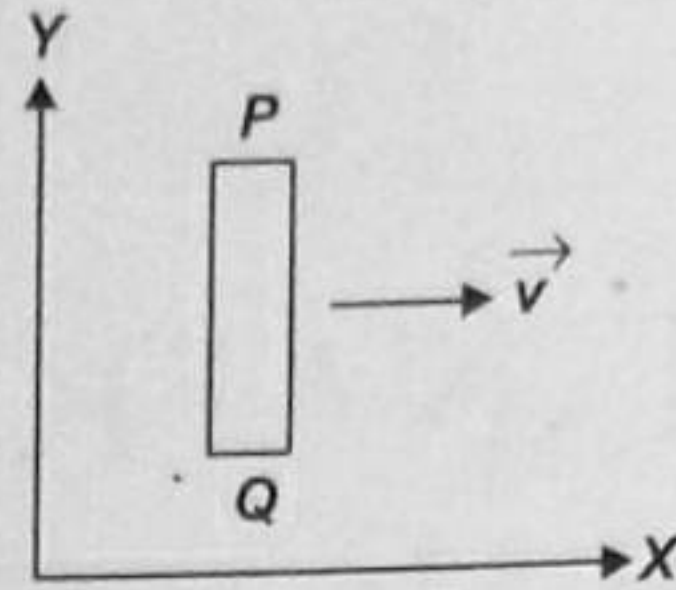
- (B) (a) – (i), (b) – (ii), (c) – (iii)
(D) (a) – (iii), (b) – (ii), (c) – (i)

3. In the given circuit if the reading of ammeter is zero. The value of ε_1 will be

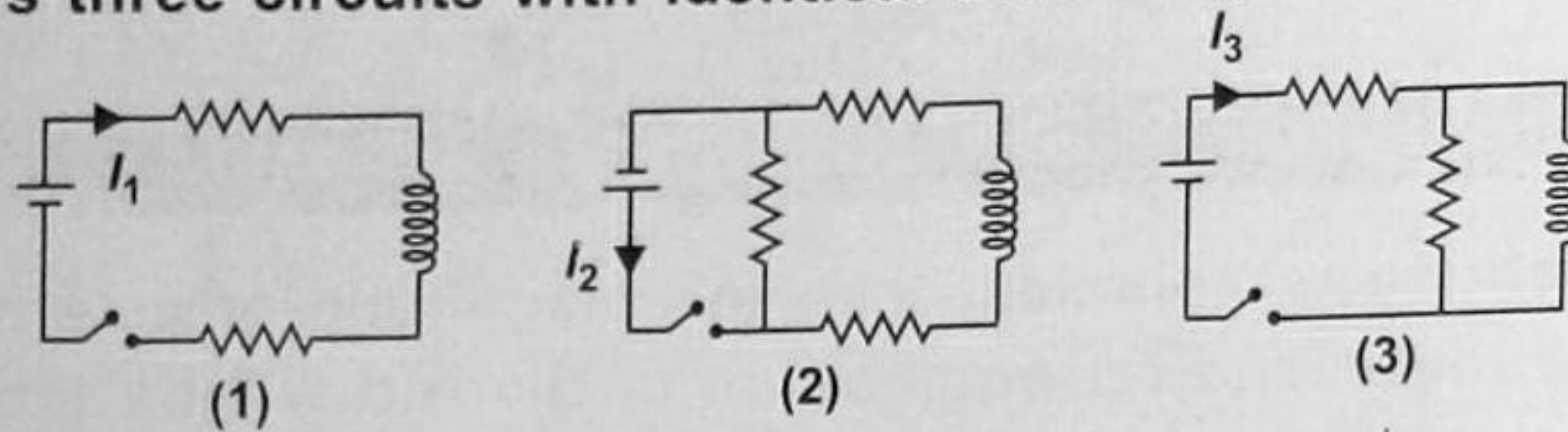


- (A) ε (B) $\frac{\varepsilon R}{R+r}$ (C) $\frac{\varepsilon(R+r)}{R}$ (D) $\frac{\varepsilon r}{R}$

4. A conducting rod PQ moves parallel to X -axis in a uniform magnetic field, pointing in the positive Z -direction. The end P of the rod gets



- (A) Positively charged
 (B) Negatively charged
 (C) Neutral
 (D) First positively charged and then negatively charged
5. The figure shows three circuits with identical batteries, inductors and resistances.



Rank the circuits according to the currents through the battery just after the switch is closed, in descending order.

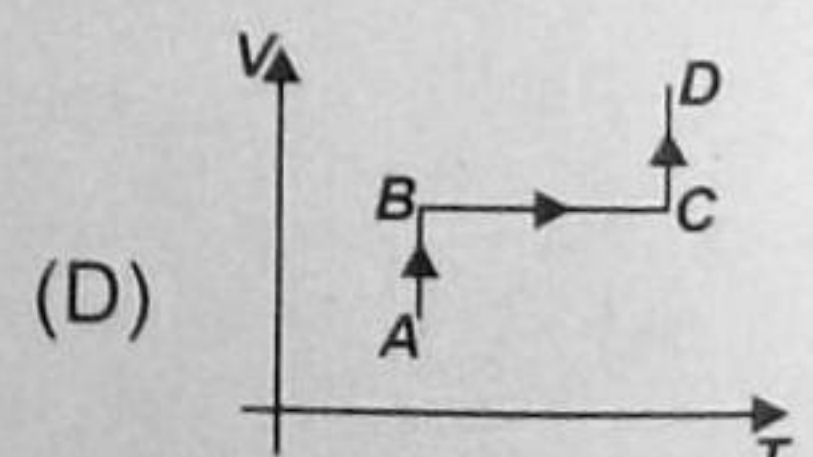
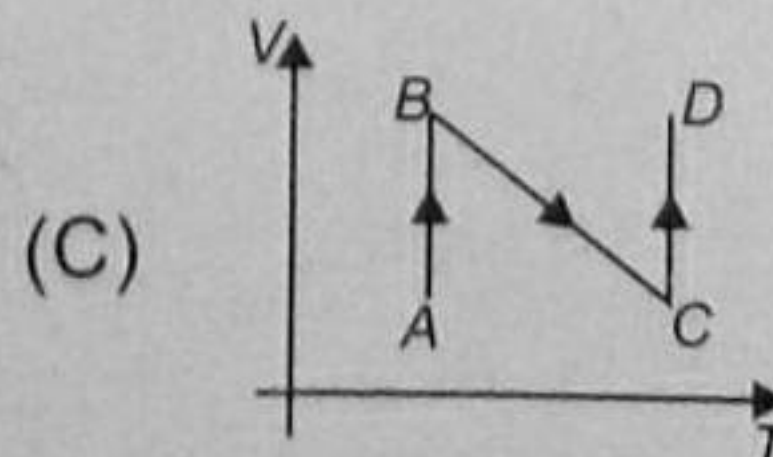
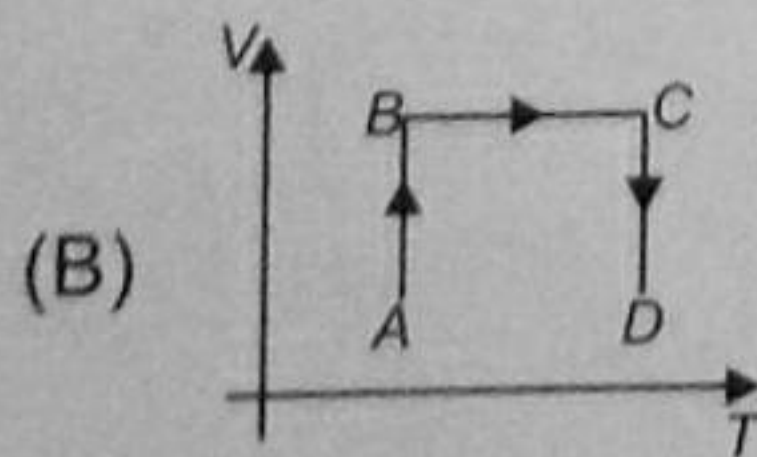
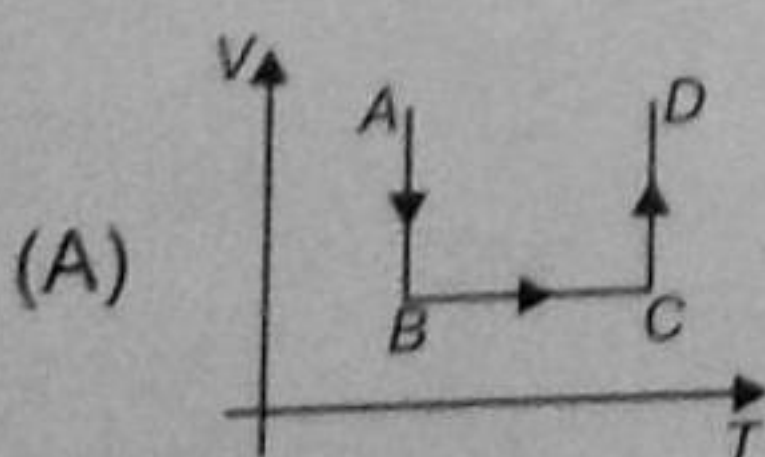
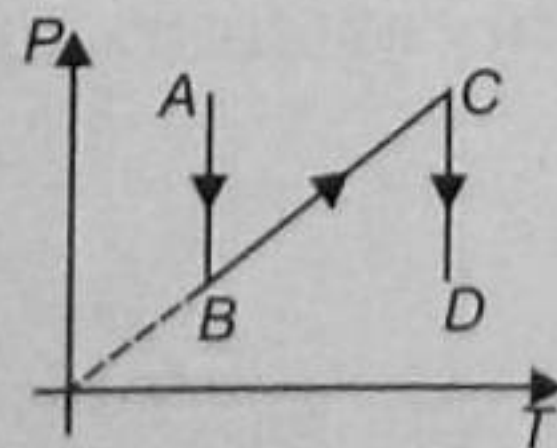
- (A) $I_2 > I_3 > I_1$ (B) $I_2 > I_1 > I_3$ (C) $I_1 > I_2 > I_3$ (D) $I_1 > I_3 > I_2$
6. Read the given statements and mark the correct option.

Statement 1 : With increase of temperature, elastic property of a substance increases.

Statement 2 : Elasticity is due to intermolecular forces which decreases with the increase of intermolecular distance.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 (B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 (C) Statement 1 is true but statement 2 is false.
 (D) Statement 1 is false but statement 2 is true.

7. P - T diagram is shown below then choose the corresponding V - T diagram.



DIRECTION : Read the passage carefully and answer Q. nos. 8, 9 and 10.
 The block of mass m is attached to two springs as shown in figure. In the equilibrium position, the springs are at their natural length. The mass oscillates along the line of springs with amplitude d . At $t = 0$, mass is at $+\frac{d}{2}$ from equilibrium and moving to right. The right spring is removed at that instant, without changing velocity of block. Neglect friction.

8. Find the new time period of oscillation if original time period was T_0 .

(A) $2T_0$

(B) $\frac{T_0}{2}$

(C) $\frac{T_0}{\sqrt{2}}$

(D) $\sqrt{2}T_0$

9. The new amplitude of mass is

(A) d

(B) $\frac{\sqrt{3}d}{2}$

(C) $\frac{\sqrt{7}d}{2}$

(D) None of these

10. The velocity of the mass when it passes through equilibrium is

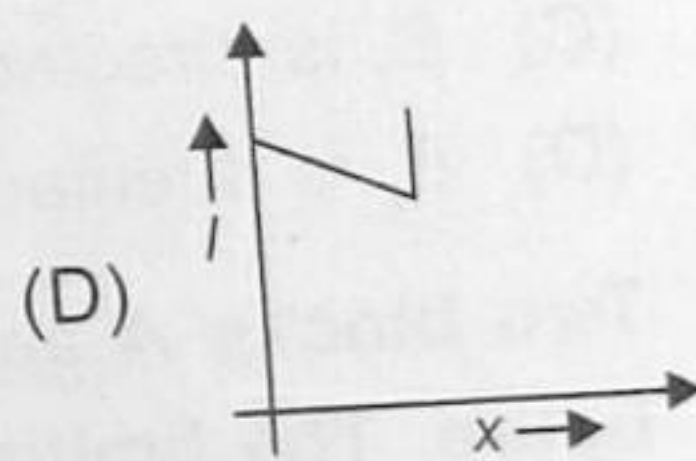
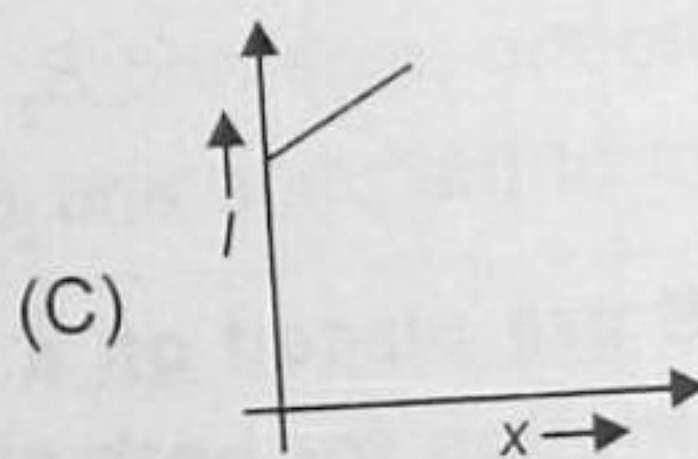
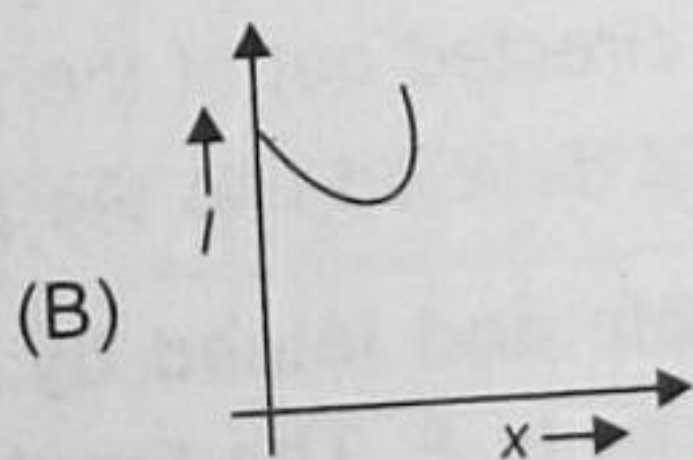
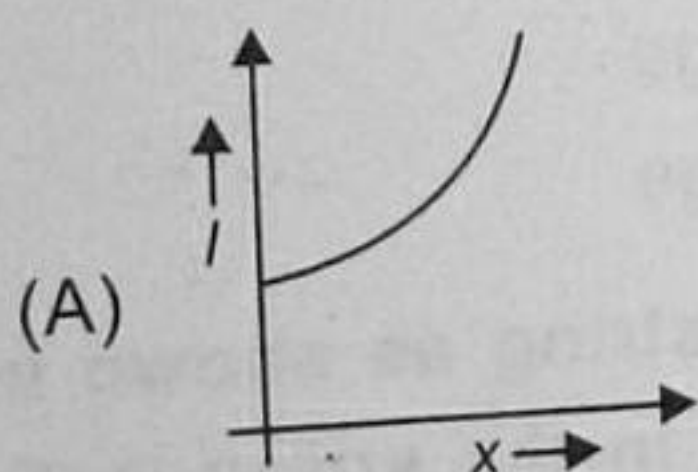
(A) $\frac{\sqrt{19}\pi d}{T_0}$

(B) $\frac{\sqrt{2}\pi d}{T_0}$

(C) $\frac{\sqrt{14}\pi d}{T_0}$

(D) None of these

11. Moment of inertia I of a solid sphere about an axis parallel to the diameter and at a distance x from it varies as



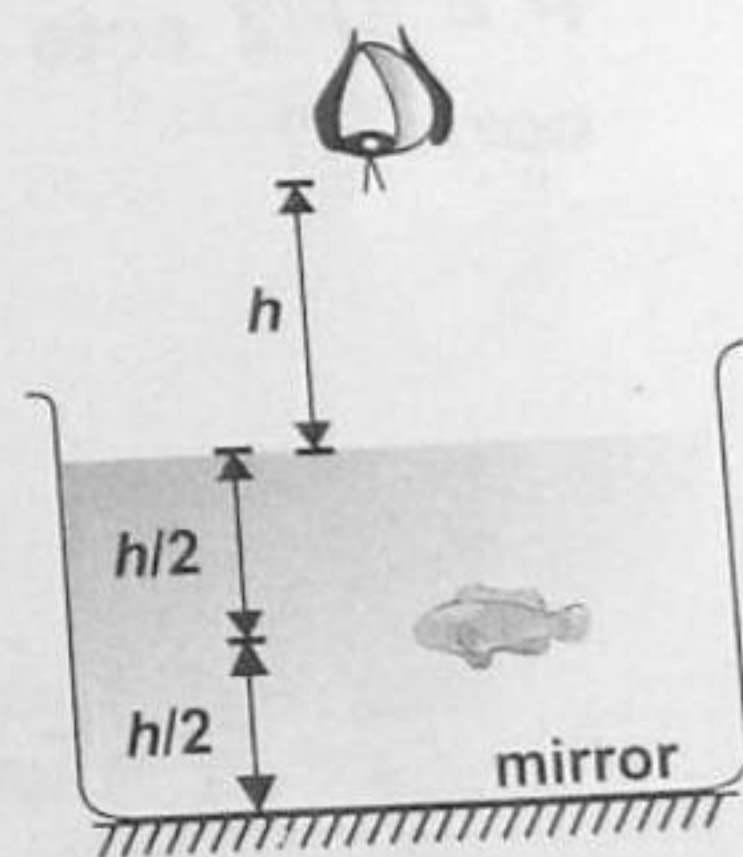
12. A fish is floating in a tank filled with water to depth h . The bottom is silvered. A boy looks at the fish from above as shown in figure. The apparent distance at which the boy sees the image of the fish is (Refractive index of water = $\frac{4}{3}$)

(A) $\frac{11h}{8}$

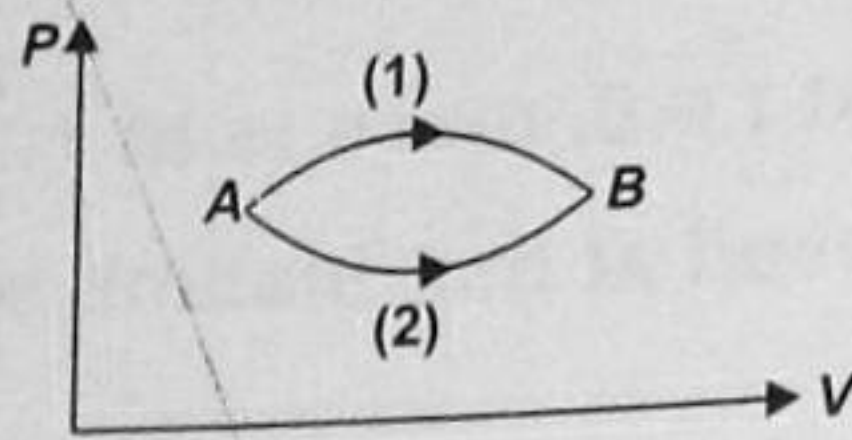
(B) $\frac{17h}{8}$

(C) $\frac{7h}{8}$

(D) $\frac{12h}{8}$

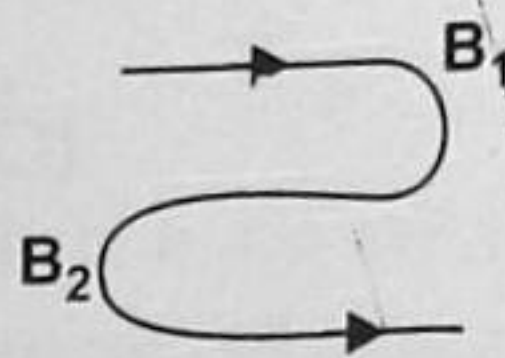


13. Statement 1 : A gas is taken from state A to state B through two different paths and molar specific heat capacity in path (1) is more as compared to path (2).

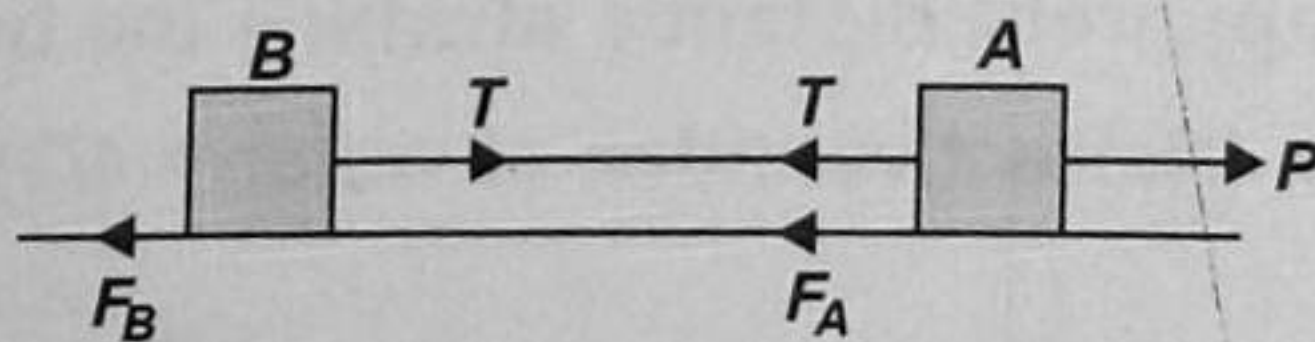


Statement 2 : If the change in internal energy is same, the molar specific heat capacity is same for any two paths.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 (B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 (C) Statement 1 is true but statement 2 is false.
 (D) Statement 1 is false but statement 2 is true.
14. In given figure, the path of an electron that passes through two regions containing uniform magnetic fields of magnitudes B_1 and B_2 . Its path in each region is a half circle. The directions of the two fields are



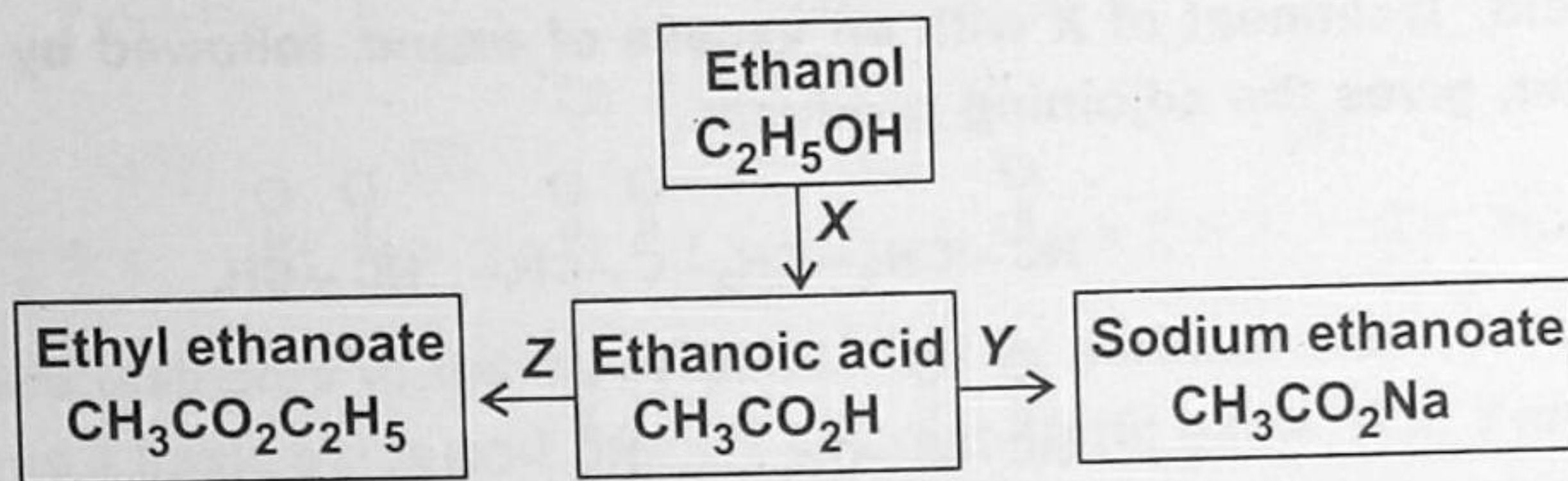
- (A) Both B_1 and B_2 are directed into the page
 (B) Both B_1 and B_2 are directed out of the page
 (C) B_1 is directed into the page and B_2 is directed out of the page
 (D) B_1 is directed out of the page and B_2 is directed into the page
15. Two blocks A and B are placed on a table and joined by a string as shown in the figure. The limiting friction for both blocks is F . The tension in the string is T . The forces of friction acting on the blocks are F_A and F_B . An external horizontal force $P = 3F/2$ acts on A , directed away from B . Which of the following relation is correct?



- (A) $F_A = F_B = T = \frac{3F}{4}$
 (B) $F_A = \frac{F}{2}, F_B = F, T = F$
 (C) $F_A = F_B = 3\frac{F}{4}, T = 0$
 (D) $F_A = F, F_B = T = \frac{F}{2}$

CHEMISTRY

16. Which of the reactions *X*, *Y* and *Z* involve oxidation?

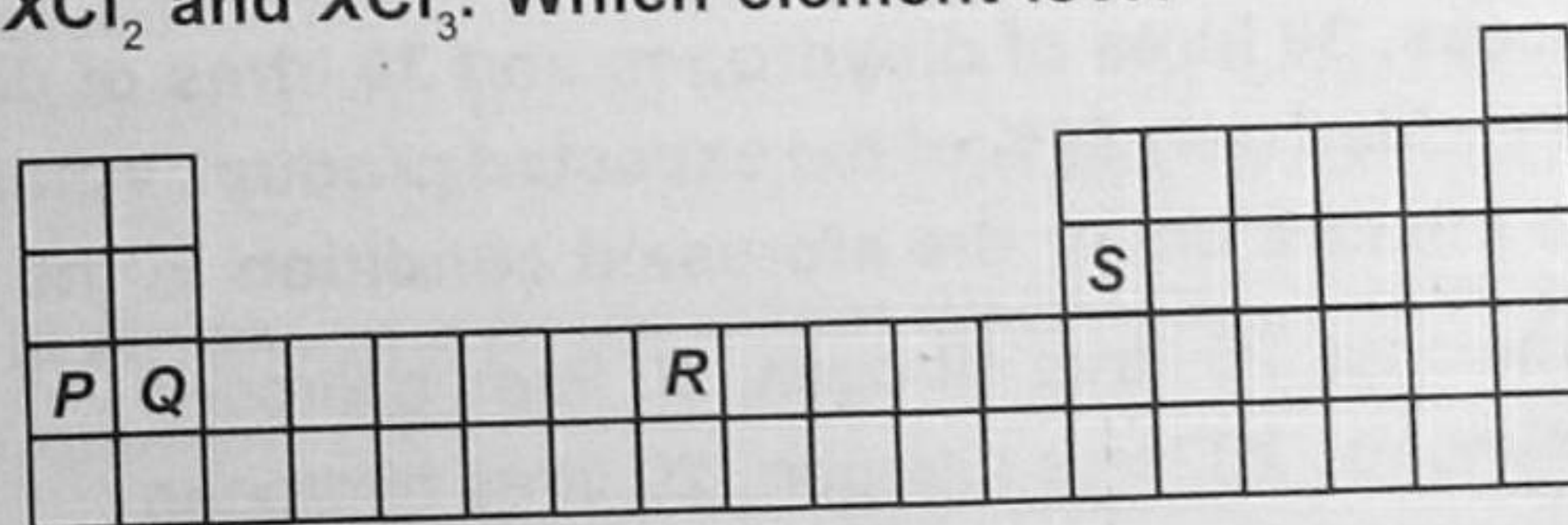


- (A) *X* only (B) *Y* only (C) *X* and *Y* (D) *Y* and *Z*

17. An element *P* is the alkali metal with the fewest protons. Element *Q* has atoms with 7 outermost electrons and belongs to the third period. Element *R* is the most variable in its properties, sometimes acting as a metal and other times as a non-metal. Element *S* has a different number of outermost electrons than its group number. Identify *P*, *Q*, *R* and *S*.

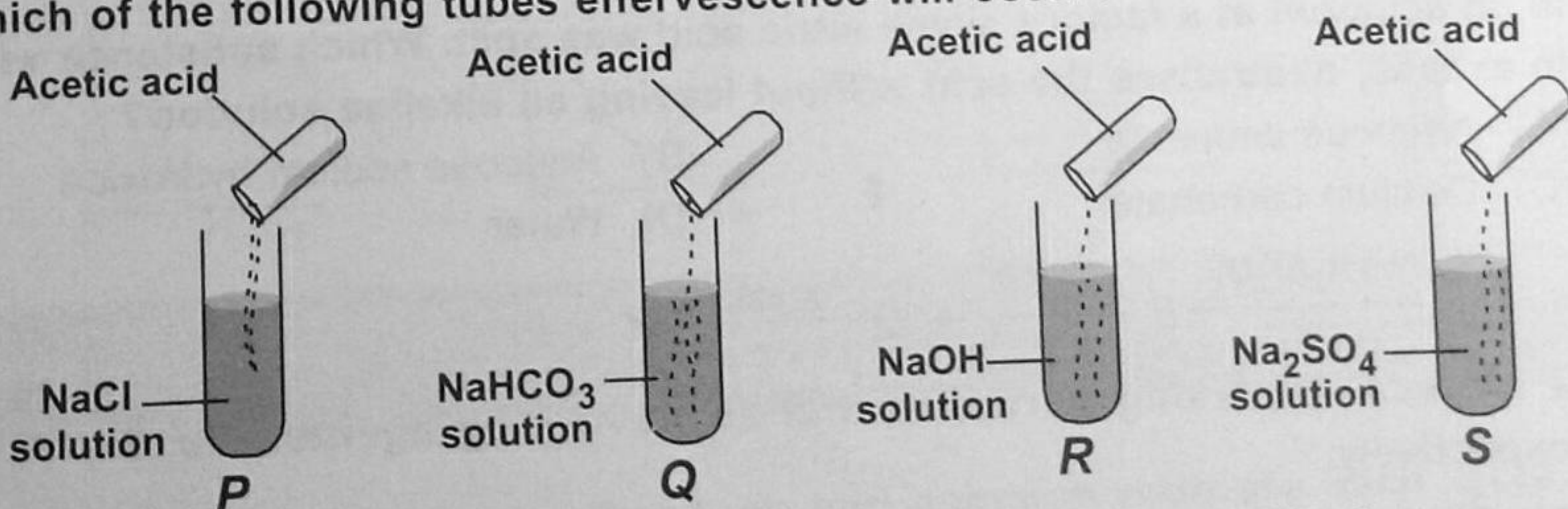
- (A) $P \rightarrow Na, Q \rightarrow O, R \rightarrow F, S \rightarrow H$ (B) $P \rightarrow H, Q \rightarrow F, R \rightarrow O, S \rightarrow Li$
 (C) $P \rightarrow Cl, Q \rightarrow Na, R \rightarrow Li, S \rightarrow O$ (D) $P \rightarrow Li, Q \rightarrow Cl, R \rightarrow H, S \rightarrow Ne$

18. The positions of four elements are shown on the outline of a part of the periodic table. Element *X* has a high melting point and is a good conductor of electricity. It forms chlorides XCl_2 and XCl_3 . Which element is *X*?



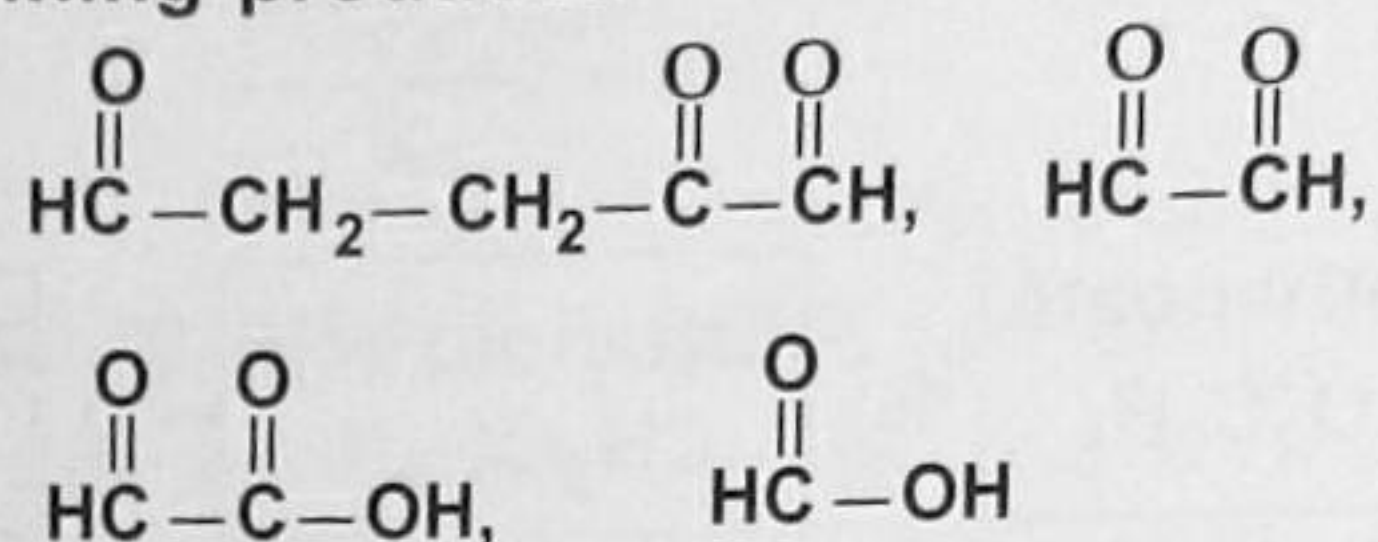
- (A) *P* (B) *Q* (C) *R* (D) *S*

19. In which of the following tubes effervescence will occur?

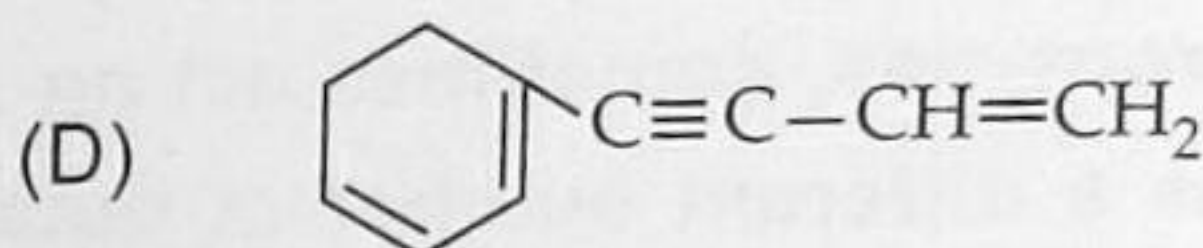
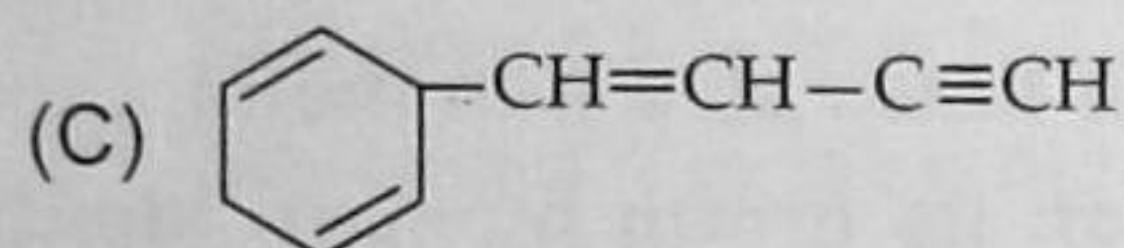
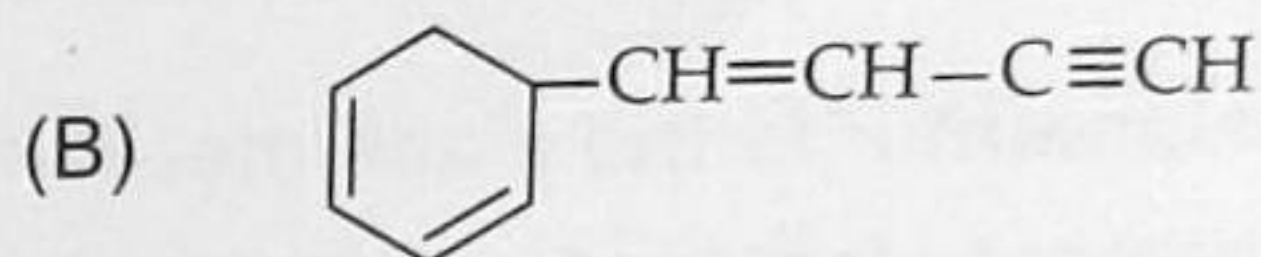
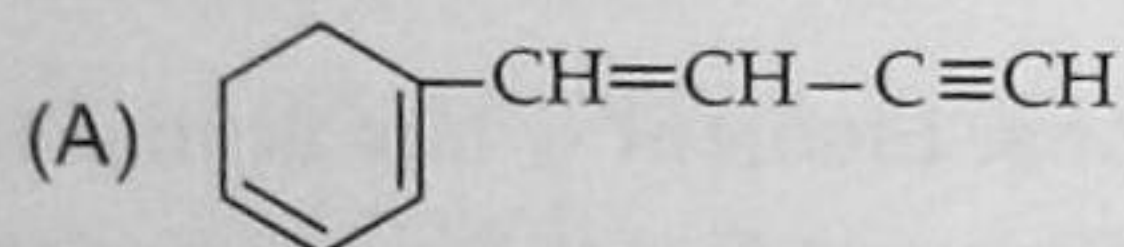


- (A) *P* (B) *Q* (C) *R* (D) *S*

20. An organic compound X on treatment with hydrogen and platinum catalyst, absorbs 5 equivalents of hydrogen to give n -butyl cyclohexane. When X is treated with silver nitrate in ethanol, a white precipitate forms. The precipitate is found to be soluble in dilute acid. Treatment of X with an excess of ozone, followed by dimethyl sulphide and water, gives the adjoining products.



Hence, compound X is



21. Which one of the following statements is incorrect?

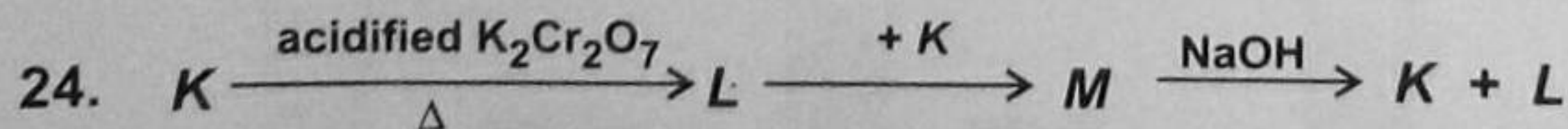
- (A) Hydrophilic part of soap dissolves in water.
 (B) The soap align along the surface of water with hydrocarbon tail in water.
 (C) The micelles stay in solution as a colloid and will not come together.
 (D) The molecules of soap are sodium or potassium salts of long-chain carboxylic acids.

22. In Haber's process, 30 litres of dihydrogen and 30 litres of dinitrogen were taken for reaction which yielded only 50% of the expected product. What will be the composition of the gaseous mixture under the aforesaid condition in the end?

- (A) 20 litres ammonia, 25 litres nitrogen, 15 litres hydrogen
 (B) 20 litres ammonia, 20 litres nitrogen, 20 litres hydrogen
 (C) 10 litres ammonia, 25 litres nitrogen, 15 litres hydrogen
 (D) 20 litres ammonia, 10 litres nitrogen, 30 litres hydrogen

23. In an accident at a factory, some nitric acid was spilt. Which substance when added in excess, neutralises the acid without leaving an alkaline solution?

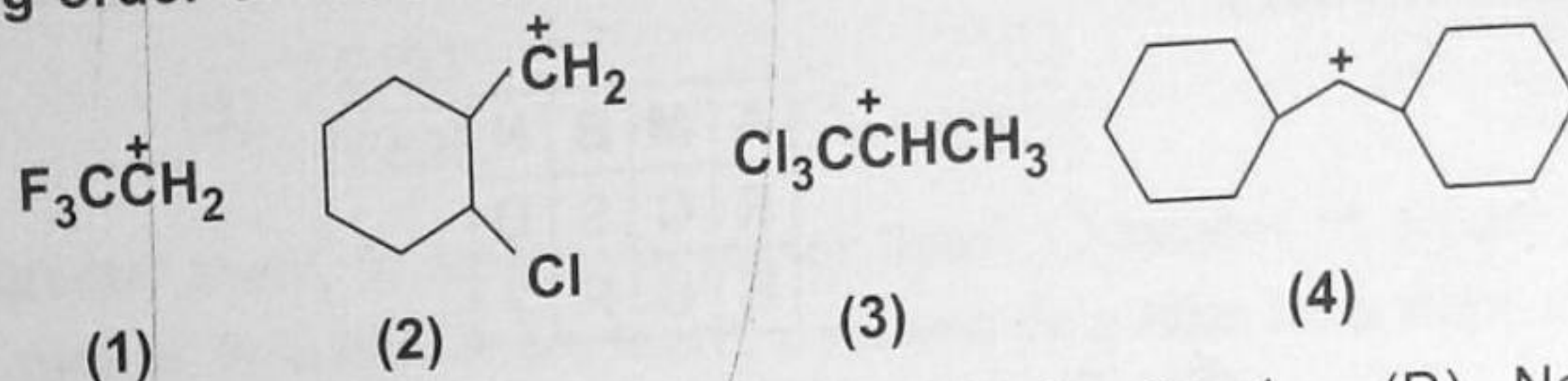
- (A) Aqueous ammonia
 (B) Aqueous sodium hydroxide
 (C) Calcium carbonate
 (D) Water



M is used in making perfumes and as flavouring agents. Identify K , L and M respectively.

- (A) $\text{CH}_3\text{CH}_2\text{COONa}$, CO_2 , $\text{CH}_3\text{CH}=\text{CH}_2$ (B) $\text{CH}_3\text{CH}_2\text{OH}$, CH_3COOH , $\text{CH}_3\text{COOCH}_2\text{CH}_3$
 (C) $\text{CH}_3\text{COOCH}_3$, CH_3COOH , $\text{CH}_3\text{CH}_2\text{OH}$ (D) $\text{CH}_2=\text{CH}_2$, $\text{CH}_3\text{CH}_2\text{OH}$, CH_3COOH

25. The decreasing order of stability of the below mentioned carbocations is



- (A) $4 > 3 > 2 > 1$ (B) $4 > 2 > 3 > 1$ (C) $3 > 4 > 2 > 1$ (D) None of these

26. X, Y and Z are elements in the same period of the periodic table. X forms an acidic oxide, Y forms a basic oxide and Z forms an amphoteric oxide. If X, Y and Z are placed in order of increasing atomic number (lowest atomic number first), which order is correct?

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

27. Choose the incorrect option.

- (A) HNO_3 and H_2SO_4 are good oxidising agents.
 (B) H_2S is a good reducing agent.
 (C) H_2SO_4 is a good dehydrating agent.
 (D) P_4O_{10} is a good hydrating agent.

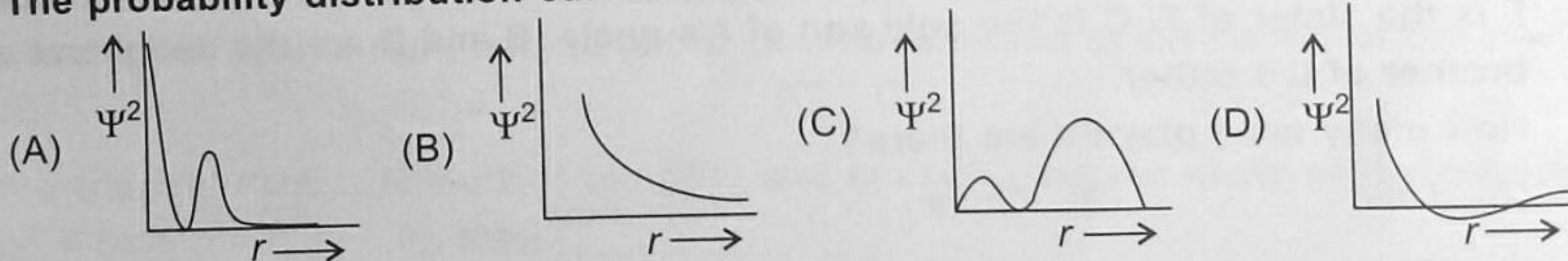
28. The pK_a of acetyl salicylic acid (aspirin) is 3.5. The pH of gastric juice in human stomach is about 2-3 and pH in the small intestine is about 8. Aspirin will be

- (A) Unionised in the small intestine and in the stomach
 (B) Completely ionised in the small intestine and in the stomach
 (C) Ionised in the stomach and almost unionised in the small intestine
 (D) Ionised in the small intestine and almost unionised in the stomach

29. Element L burns in air giving a product that dissolves in water producing an alkaline solution. What is element L?

- (A) Carbon (B) Iron (C) Sodium (D) Sulphur

30. The probability distribution curve for 2s-electron appears like



SECTION-2

MATHEMATICS

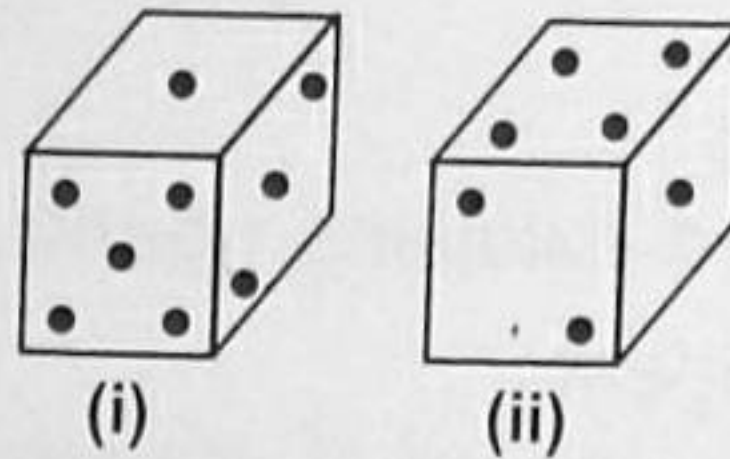
31. In a geometric progression, first term and common ratio are each $\frac{1}{2}(\sqrt{3} + i)$. The absolute value of the n^{th} term of the G.P. is _____.

- (A) 2^n (B) 4^n (C) 1 (D) None of these

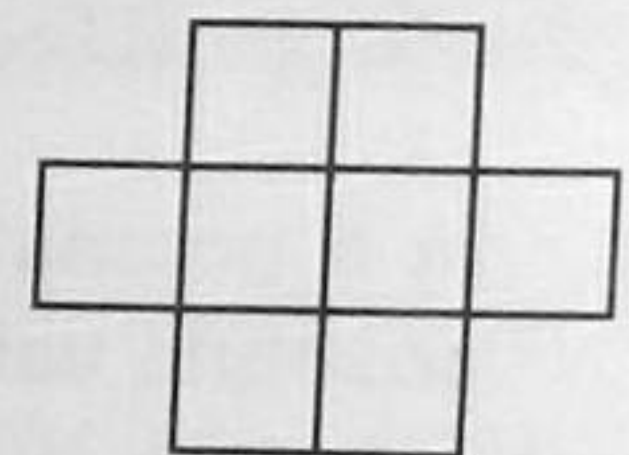
32. In the given question, which character when placed at the sign of interrogation shall complete the matrix?

A	M	B	N
R	C	S	D
E	U	F	?

- (A) G (B) R (C) T (D) V
33. If $\cos(\theta - \alpha) = a$, $\cos(\theta - \beta) = b$, then $\sin^2(\alpha - \beta) + 2abc\cos(\alpha - \beta)$ is equal to _____.
- (A) $a^2 + b^2$ (B) $a^2 - b^2$ (C) $b^2 - a^2$ (D) $-a^2 - b^2$
34. Two positions of a dice are shown. When there are two dots at the bottom, the number of dots at the top will be _____.



- (A) 3 (B) 5
(C) 6 (D) Cannot be determined
35. All possible 7-digit numbers are formed by arranging digits from the set $\{1, 2, 3, \dots, 7\}$ without repetition of any digit. The probability that a randomly selected number out of the above numbers, will be divisible by 4, is _____.
- (A) $\frac{2}{7}$ (B) $\frac{1}{4}$ (C) $\frac{4}{21}$ (D) $\frac{5}{21}$
36. $4^{1/2} \times 4^{1/4} \times 4^{1/8} \times \dots$ to ∞ is a root of the equation _____.
- (A) $x^2 - 4 = 0$ (B) $x^2 - 4x + 6 = 0$ (C) $x^2 - 5x + 4 = 0$ (D) $x^2 - 3x + 2 = 0$
37. Read the following information carefully and answer the question given below:
There are six children playing football, namely A, B, C, D, E and F. A and E are brothers. F is the sister of E. C is the only son of A's uncle. B and D are the daughters of the brother of C's father.
How many male players are there?
- (A) One (B) Three (C) Four (D) Five
38. Six 'X's have to be placed in the squares of the given figure such that each row contains at least one 'X'. The number of ways in which this can be done is _____.



- (A) 26
(B) 27
(C) 22
(D) None of these

39. In shuffling a pack of playing cards, four cards are accidentally dropped. The probability that the dropped cards are one from each suit, is _____.
- (A) $\frac{2191}{20825}$ (B) $\frac{2193}{20825}$ (C) $\frac{2183}{20825}$ (D) $\frac{2197}{20825}$
40. If Δ means 'is greater than', $\%$ means 'is lesser than', \square means 'is equal to', $=$ means 'is not equal to', $+$ means 'is a little more than', \times means 'is a little less than' and $a \Delta b$ and $b + c$ are true, then _____.
- (A) $a \% c$ (B) $c \% a$ (C) $c + a$ (D) Can't say
41. If S.D. of n observations x_1, x_2, \dots, x_n is 7 and another set of n observations y_1, y_2, \dots, y_n is 8, then S.D. of n observations $x_1 - y_1, x_2 - y_2, \dots, x_n - y_n$ is _____.
- (A) 1 (B) $\sqrt{\frac{7}{8}}$ (C) Data inadequate (D) Can't be determined
42. If $A = \{1, 3, 5, 7, 9, 11, 13, 15, 17\}$, $B = \{2, 4, 6, 8, 10, 12, 14, 16, 18\}$ and N is the universal set, then $A' \cup ((A \cup B) \cap B')$ is equal to _____.
- (A) A (B) N (C) B (D) None of these
43. A motorist knows four different routes from Bristol to Birmingham. From Birmingham to Sheffield he knows three different routes and from Sheffield to Carlisle he knows two different routes. How many routes does he know from Bristol to Carlisle?
- (A) 4 (B) 8 (C) 12 (D) 24
44. If coordinates of the vertices A, B, C of a triangle ABC are $(6, 0), (0, 6)$ and $(7, 7)$ respectively, then centre of the circle touching AB internally and BC and CA produced is _____.
- (A) $(-3, 3)$ (B) $(-4, -4)$ (C) $(-2, -2)$ (D) None of these
45. Nine cricket fans are watching a match in a stadium. Seated in one row, they are J, K, L, M, N, O, P, Q and R. L is at the right of M and at third place at the right of N. K is at one end of the row. Q is seated adjacent to both O and P. O is at the third place at the left of K. J is right next to left of O. Who is sitting at the centre of the row?
- (A) I (B) J (C) O (D) Q
46. In a triangle PQR , $\angle R = \pi/2$. If $\tan (P/2)$ and $\tan (Q/2)$ are the roots of the equation $ax^2 + bx + c = 0$, ($a \neq 0$), then _____.
- (A) $a + b = c$ (B) $b + c = 0$ (C) $a + c = b$ (D) $b + c$
47. The number of letters skipped between adjacent letters in the series decreases from 5 to 1. Which one of the following series does not observe the rule given above?
- (A) OIDZWU (B) QKFCYW (C) WQLHEC (D) ZTOKHF

48. Reaching the place of meeting 30 minutes before 10 : 30 hrs, Sahil found himself twenty minutes earlier than the man who came 30 minutes late. What was the scheduled time of the meeting?
 (A) 10 : 20 hrs (B) 10 : 05 hrs (C) 10 : 10 hrs (D) None of these
49. If 'cinto baoli tsi nzro' means 'her village is Sarurpur', 'mhi cinto keepi tsi oind' means 'her first love is literature; and 'oind geit tsi cinto pki' means 'literature collection is her hobby', which word would mean 'literature'?
 (A) cinto (B) baoli (C) oind (D) geit
50. The town of Paranda is located on Green Lake. The town of Akram is west of Paranda. Tokhada is east of Akram but west of Paranda. Kakran is east of Bopri but west of Tokhada and Akram. If they are all in the same district, which town is the farthest west?
 (A) Paranda (B) Kakran (C) Akram (D) Bopri

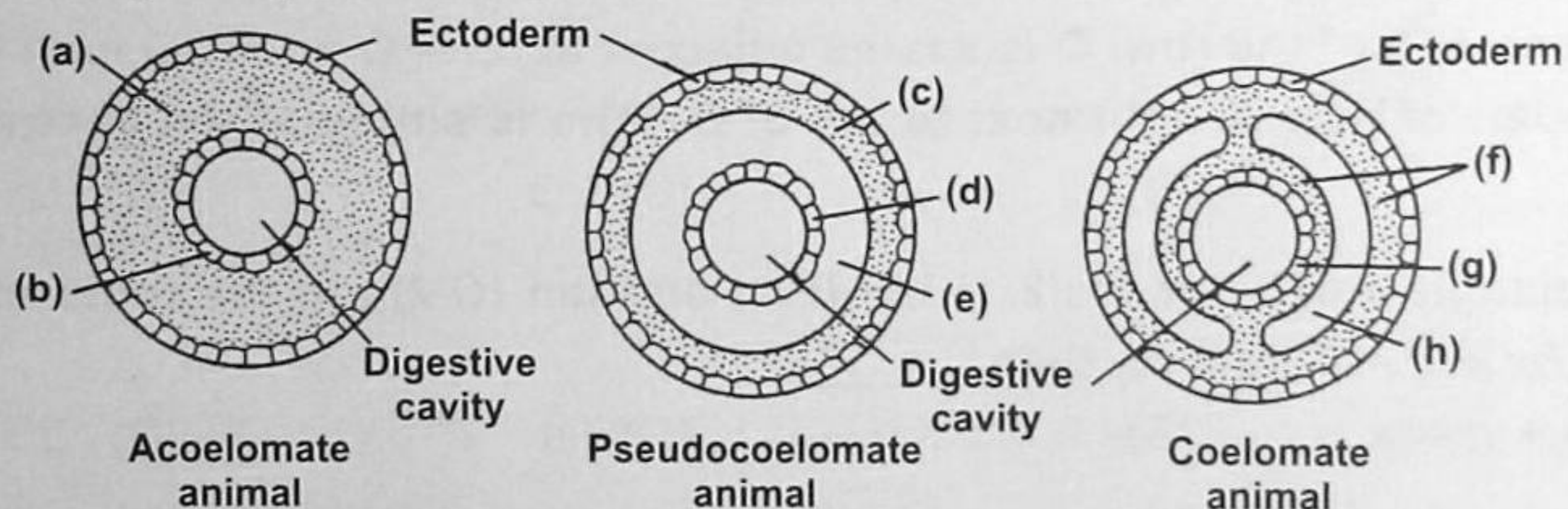
OR

BIOLOGY

31. Seema has observed that whenever she is under stress, she easily falls sick. At least thrice she had fallen sick because of common cold or stomach infection during her stressful days. She formulated a hypothesis, "under stress, a person is more prone to fall sick".

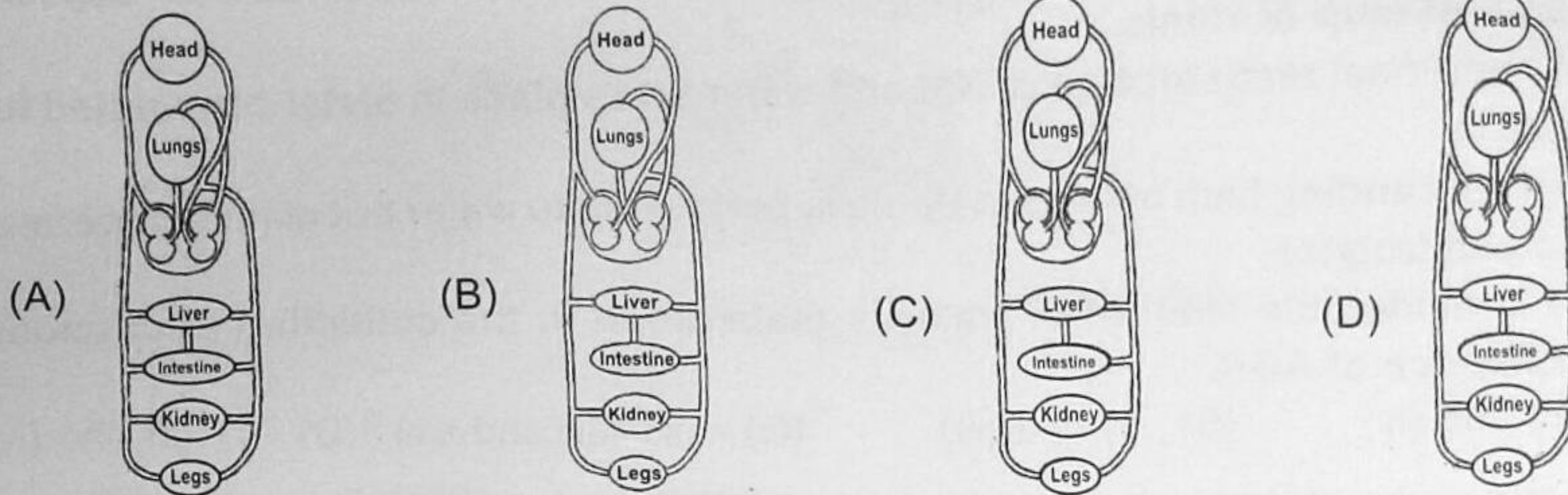
How would she support her hypothesis?

- (A) When we are under stress our body secretes thyrotropin.
 (B) When we are under stress our body secretes cortisol.
 (C) When we are under stress our body secretes aldosterone.
 (D) When we are under stress are body secretes enkephalin.
32. Given below are three schematic cross sections through bilaterally symmetrical animals. Identify the parts labelled as a to h and select the correct option.



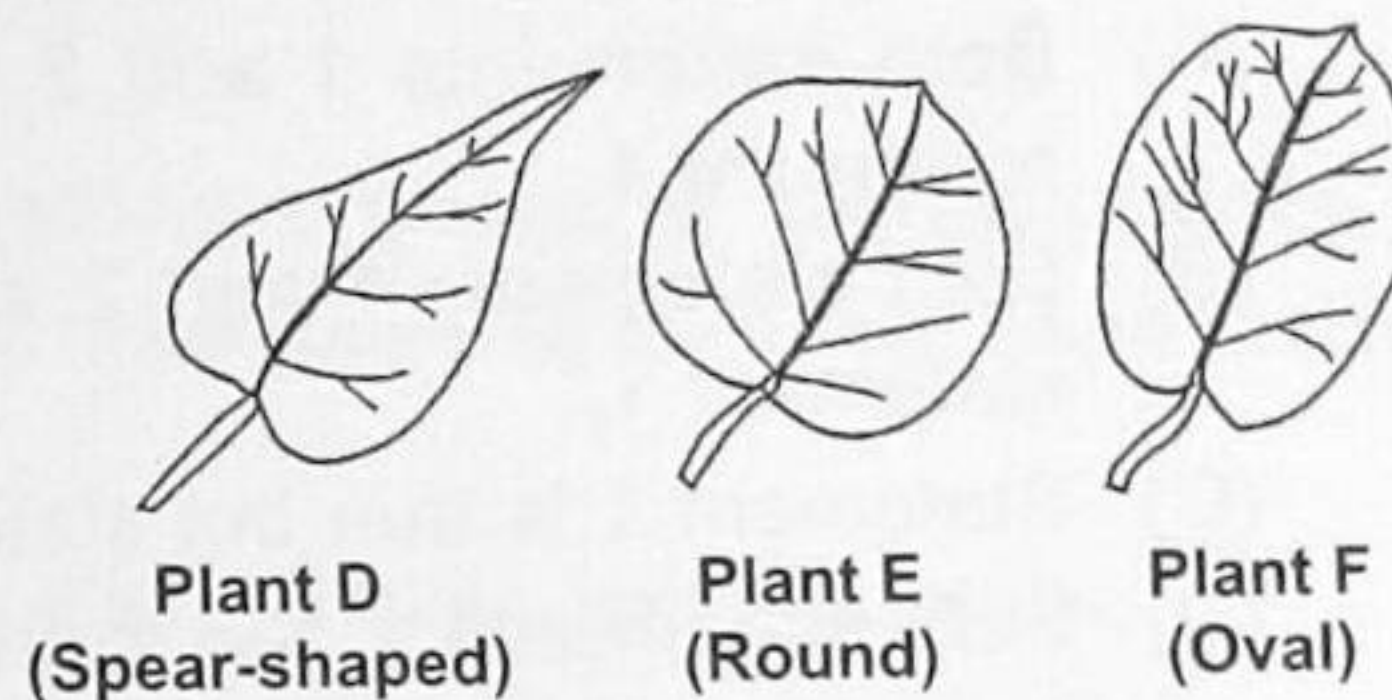
- (A) (b, d, g) - mesoderm; (a, c, f) - endoderm; (e) - coelom; (h) - pseudocoelom
 (B) (a, c, f) - mesoderm; (b, d, g) - endoderm; (e) - pseudocoelom; (h) - coelom
 (C) (b, d, g) - mesoderm; (a, c, f) - endoderm; (e) - pseudocoelom; (h) - coelom
 (D) (b, d, g) - pseudocoelom; (a, c, f) - coelom; (e) - mesoderm; (h) - endoderm

33. The given diagrams represent circulatory system. Which diagram is correct for an adult human?



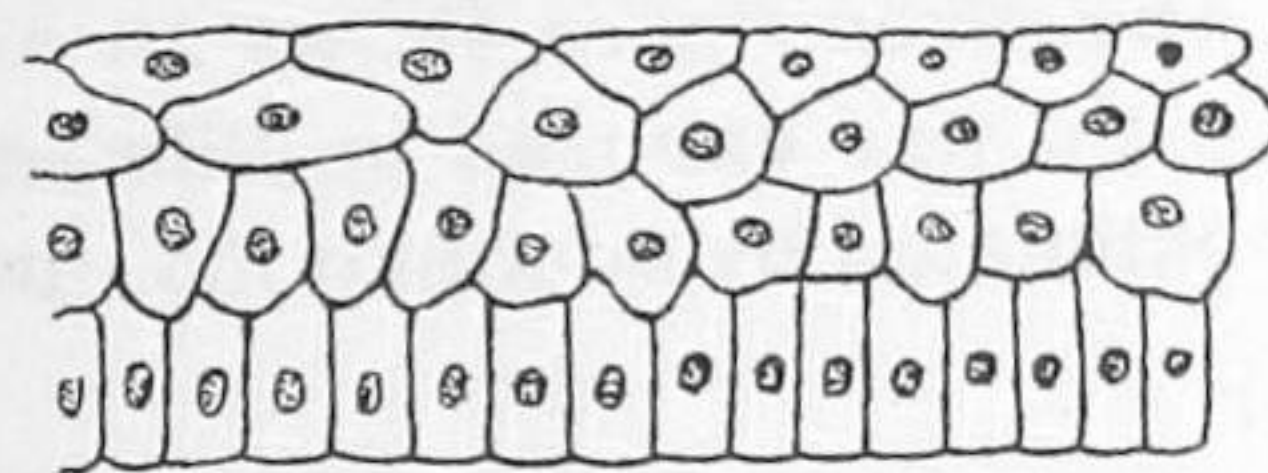
34. The given figure shows leaves of three plants D, E and F, of the same species. In this species of plant, leaf shape is controlled by two alleles, S^1 and S^2 . When plant D is crossed with plant F, the offsprings showed 1 : 1 ratio of the two different leaf shapes of plant D and plant F. Which of the following shows correct genotype of the plants D, E and F ?

- (A) Plant D- $S^1 S^1$, Plant E- $S^2 S^2$, Plant F- $S^1 S^1$
 (B) Plant D- $S^2 S^2$, Plant E- $S^1 S^2$, Plant F- $S^2 S^2$
 (C) Plant D- $S^2 S^2$, Plant E- $S^2 S^2$, Plant F- $S^1 S^1$
 (D) Plant D- $S^1 S^1$, Plant E- $S^2 S^2$, Plant F- $S^1 S^2$



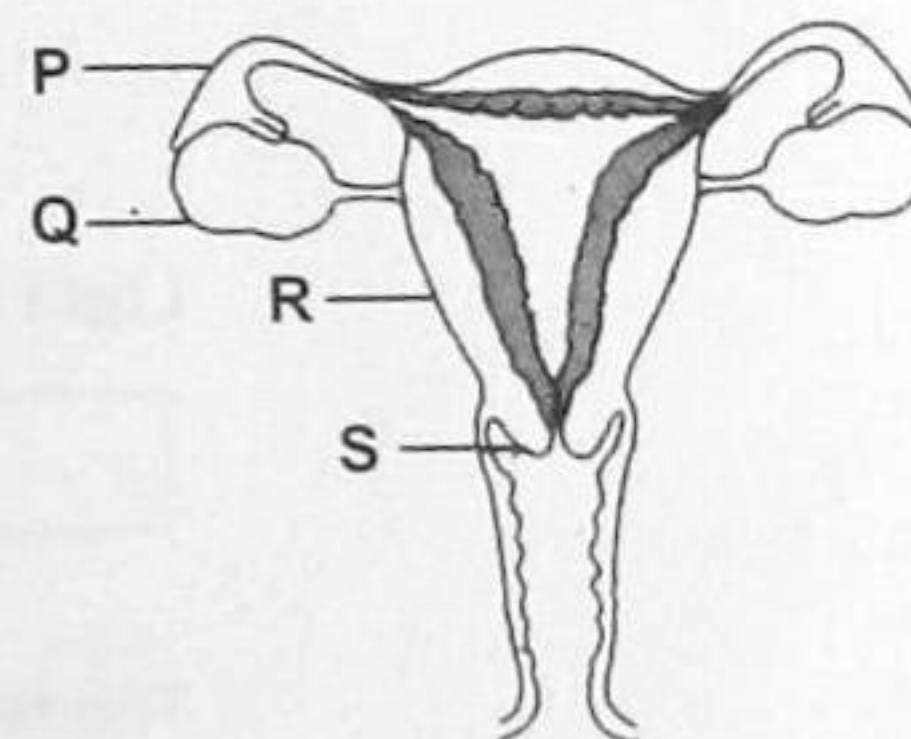
35. The given epithelium is present in

- (A) Urinary bladder
 (B) Fallopian tubes
 (C) Intestine
 (D) Testes



36. In which labelled part of the given figure does the fertilization of an ovum by a sperm take place?

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



37. Which of the following comparisons of functions of sympathetic nervous system and parasympathetic nervous system is correct ?

Sympathetic nervous system	Parasympathetic nervous system
(A) Slows heart beat	Accelerates heart beat
(B) Slows peristalsis	Speeds peristalsis
(C) Constricts urinary bladder	Relaxes urinary bladder
(D) Dilates arteries and lowers blood pressure	Constricts arteries and raises blood pressure

38. Which of the following statements are correct ?
- (i) Nearly 70-80 per cent of electrolytes and water are reabsorbed by descending limb of loop of Henle.
 - (ii) Conditional reabsorption of Na^+ and water takes place in distal convoluted tubule (DCT).
 - (iii) The ascending limb of loop of Henle is permeable to water but almost impermeable to electrolytes.
 - (iv) A considerable amount of water is reabsorbed in the collecting duct under the influence of ADH.
- (A) (ii) and (iv) (B) (i) and (iv) (C) (ii), (iii) and (iv) (D) (i), (ii) and (iv)

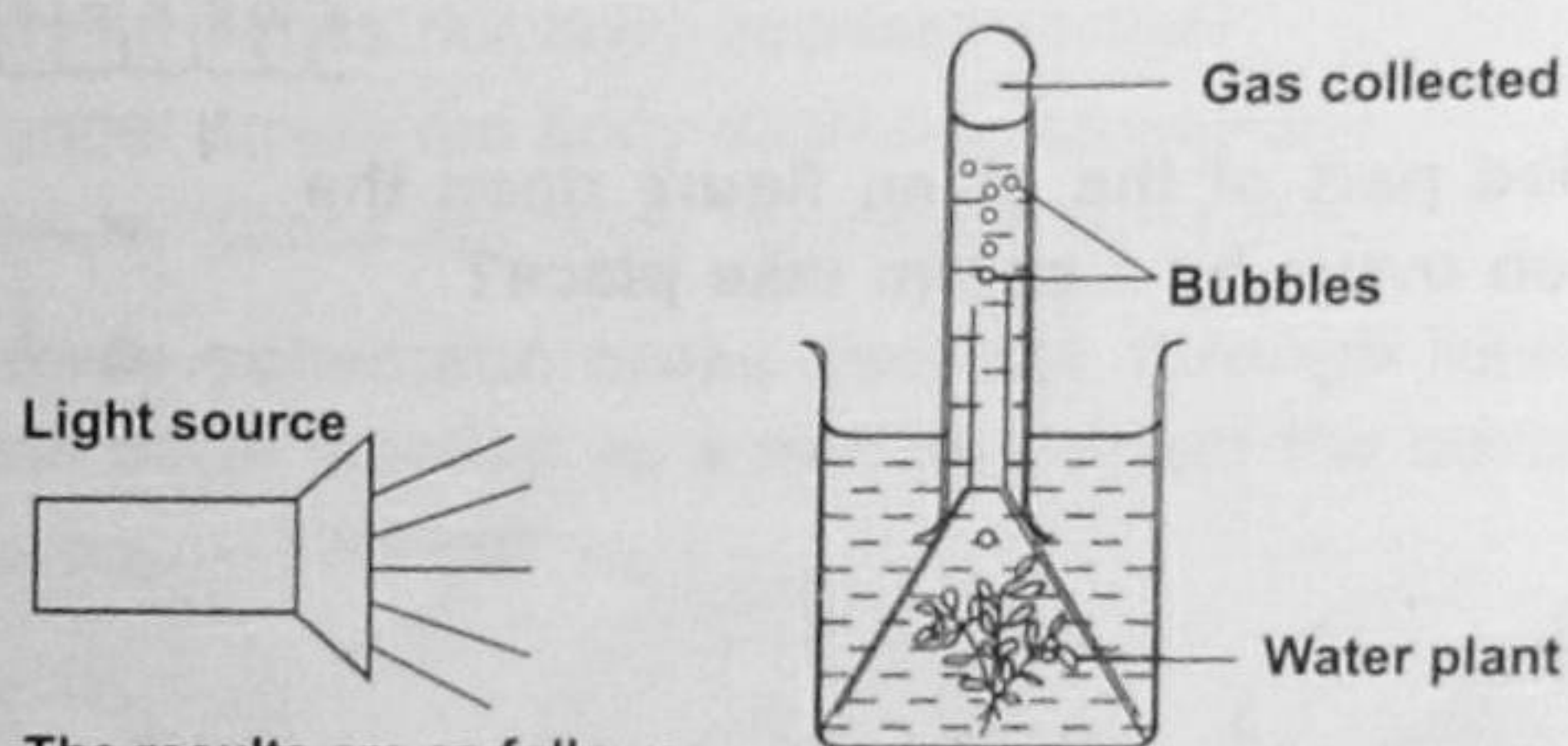
39. Read the given statements and select the correct option.

Statement 1 : The collection of mechanisms, behaviours, and physiological processes which check the population of two different species from interbreeding is called reproductive isolation.

Statement 2 : Reproductive isolation brings about sympatric speciation.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- (B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- (C) Statement 1 is true but statement 2 is false.
- (D) Both statements 1 and 2 are false.

40. The given figure shows an experimental set-up to investigate photosynthesis. The plant was exposed to different light intensities and the rate of photosynthesis was estimated by counting the number of bubbles produced by the plant.



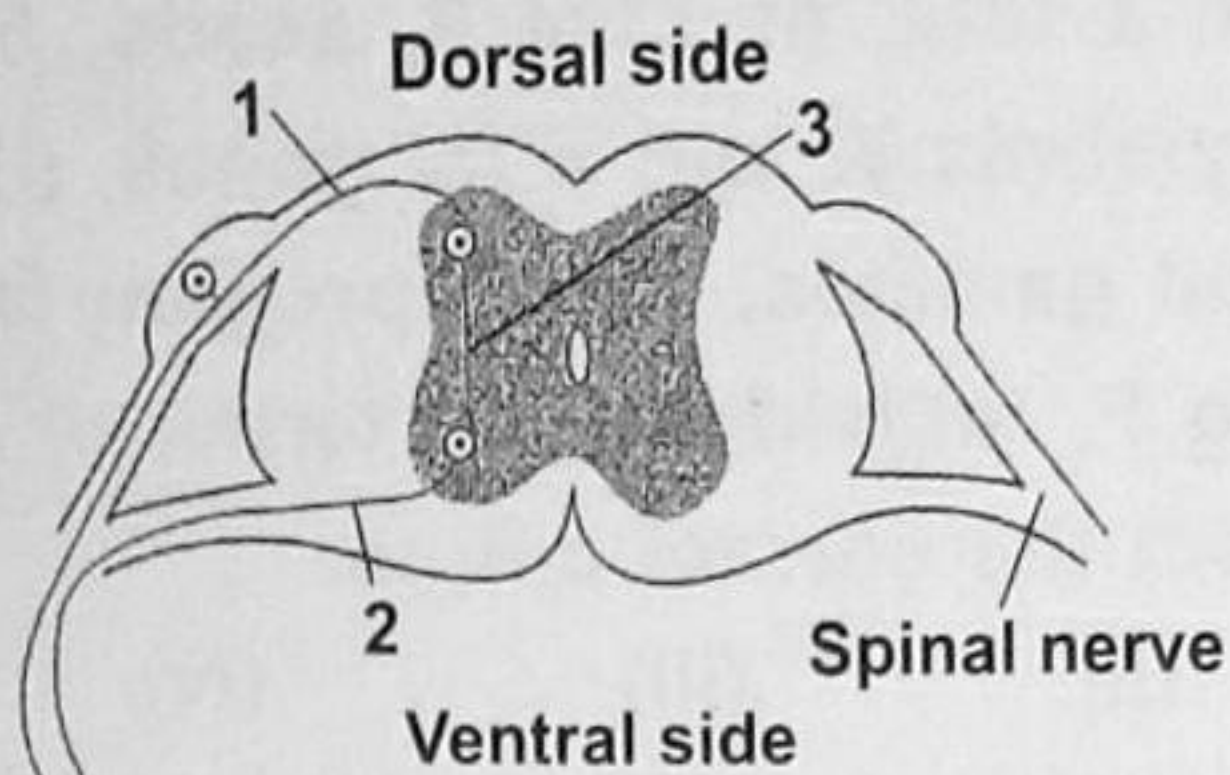
The results are as follows:

Light intensity (unit)	1	2	3	4	5
Number of bubbles	4	20	24	28	28

What can you infer from the given experiment?

- (A) The rate of photosynthesis increases with increasing light intensities.
- (B) Light intensity limits photosynthesis only upto a certain extent.
- (C) The rate of photosynthesis in the given experimental set-up is determined by the rate of production of oxygen gas.
- (D) Both (A) and (B)

41. Identify 1, 2 and 3 in the given figure and select the correct option.

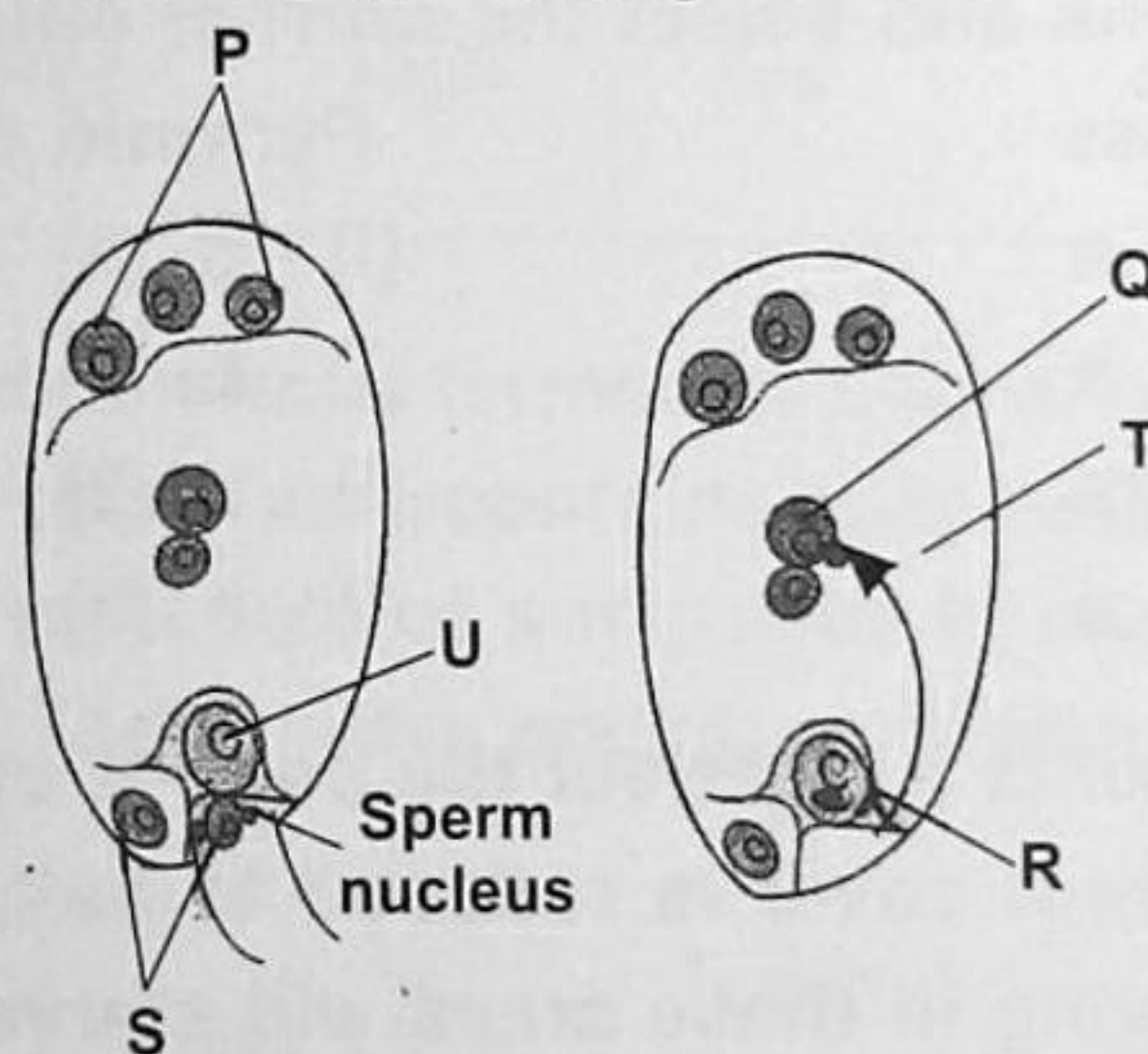


	Motor neuron	Relay neuron	Sensory neuron
(A)	1	2	3
(B)	1	3	2
(C)	2	1	3
(D)	2	3	1

42. One plant hormone is used to speed up the malting process in barley, another is used to promote flowering in pineapple, while the third helps in delaying senescence. These hormones respectively are _____.

- (A) Gibberellin, auxin and cytokinin (B) Auxin, cytokinin and gibberellin
 (C) Auxin, gibberellin and cytokinin (D) Cytokinin, auxin and gibberellin

43. Refer the given figure and read the following statements.



- (i) The parts labelled as P, S, U and T are haploid structures.
 (ii) The part labelled as Q will develop into future endosperm.
 (iii) The parts labelled as T and R will form main embryo.
 (iv) The part labelled as T is called embryo sac.
 (v) P can be called vestigial structure.

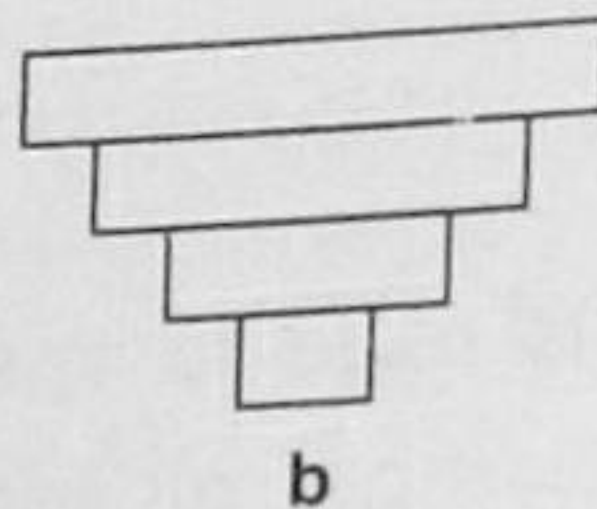
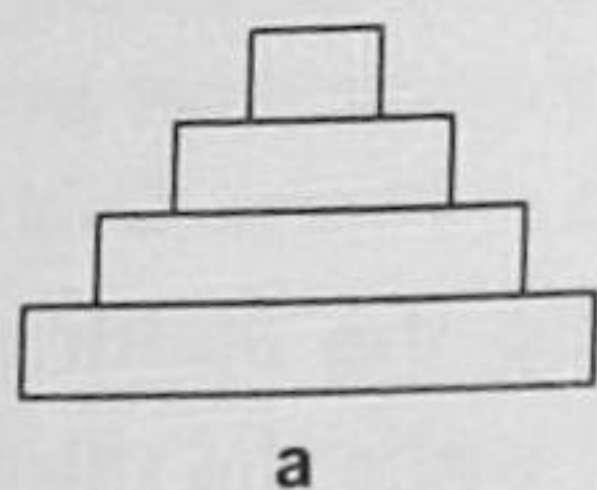
Which among these are incorrect statements?

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

44. Mendel crossed pea plants that produced round seeds with those that produced wrinkled seeds. From a total of 7324 F_2 seeds, 5493 were round and 1831 were wrinkled. Using the symbols W and w for genes, (i) symbolize the original parental cross, (ii) the parental gametes, (iii) F_1 progeny and (iv) the expected F_2 results (obtained by crossing F_1 individuals) in terms of genotypic and phenotypic ratios respectively, and select the correct option.

	(i)	(ii)	(iii)	(iv)
(A)	$W W \times W W$	W, W	$W W$	$1 : 1$ and $3 : 1$
(B)	$W W \times w w$	W, w	$W w$	$1 : 2 : 1$ and $3 : 1$
(C)	$W w \times w w$	W, w	$w w$	$1 : 2 : 1$ and $3 : 1$
(D)	$W w \times W w$	W, w	$W w$	$9 : 3 : 3 : 1$ and $3 : 1$

45. Refer the three food chains given below :



- (i) Tree \rightarrow Birds \rightarrow Bugs \rightarrow Fungi
- (ii) Algae \rightarrow Protozoa \rightarrow Small fish \rightarrow Large fish
- (iii) Grass \rightarrow Rabbits \rightarrow Snakes \rightarrow Eagle

The given figures show two shapes of ecological pyramids. Match them with the above given food chains and select the correct option.

Pyramid of biomass	Pyramid of number
(A) (i) - a, (ii) - b, (iii) - a	(i) - b, (ii) - a, (iii) - a
(B) (i) - b, (ii) - b, (iii) - a	(i) - b, (ii) - a, (iii) - a
(C) (i) - a, (ii) - b, (iii) - a	(i) - a, (ii) - a, (iii) - a
(D) (i) - b, (ii) - b, (iii) - a	(i) - a, (ii) - a, (iii) - a

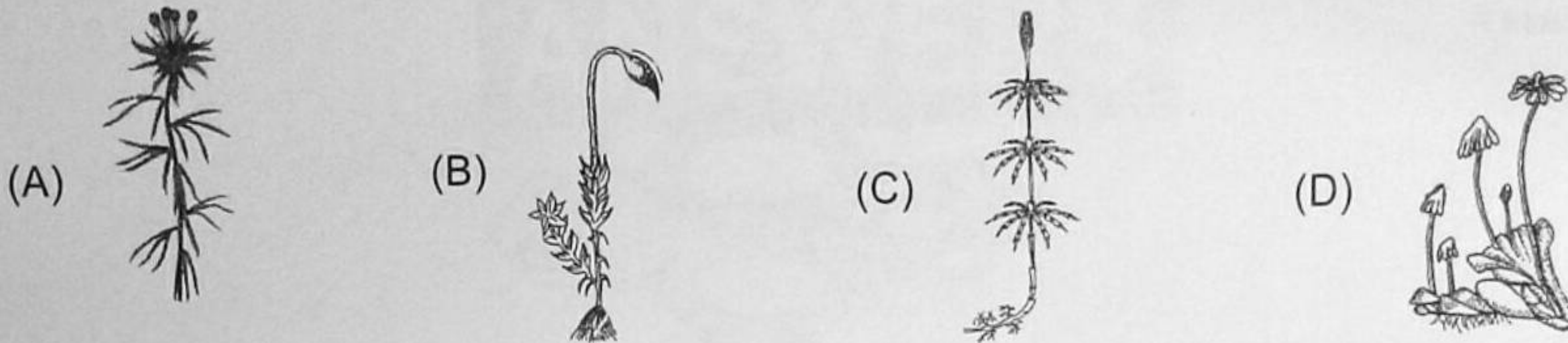
46. Read the given statements and select the correct option.

Statement 1 : If the forest cover is reduced to half, then as a long term effect the tribals living in these areas will starve to death.

Statement 2 : Forests are essential as they conserve wild plants so their lack will affect crop breeding programmes.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- (B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- (C) Statement 1 is false and statement 2 is true.
- (D) Both statements 1 and 2 are false.

47. Which of the following does not belong to the group of other three?

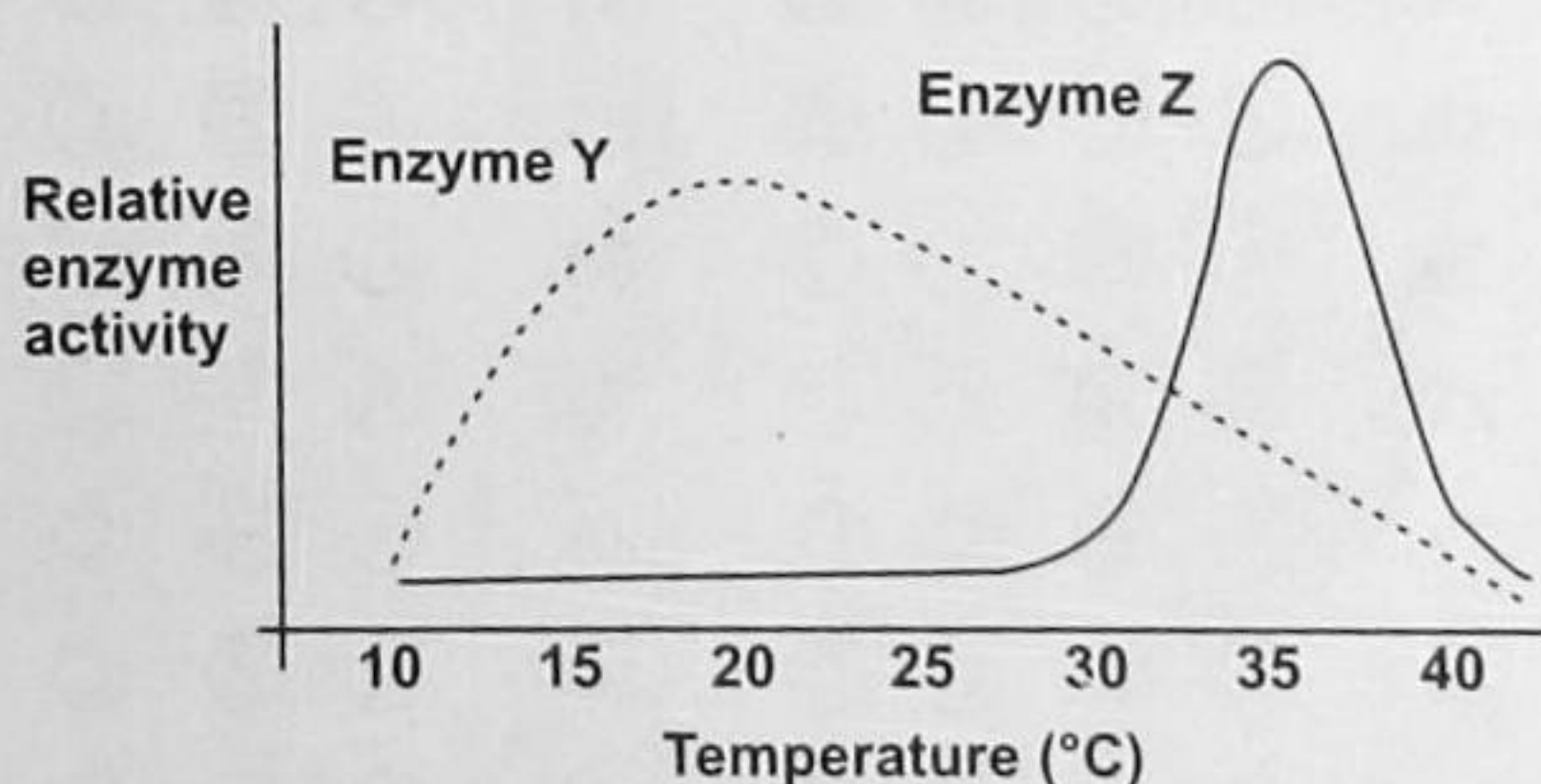


48. Which of the following options is correct for C_3 and C_4 plants for the following conditions?

- (i) Initial carboxylation.
- (ii) CO_2 fixation rate under high light intensity.
- (iii) Photorespiration would be present at low CO_2 concentration.
- (iv) Photorespiration is present at low light intensity.
- (v) Optimum temperature for photosynthesis.

(i)		(ii)		(iii)		(iv)		(v)	
C_3 plant	C_4 plant	C_3 plant	C_4 plant	C_3 plant	C_4 plant	C_3 plant	C_4 plant	C_3 plant	C_4 plant
Mesophyll	Mesophyll	High	High	High		Negligible		20 – 25°C	Above 40°C
Mesophyll	Bundle sheath	Low	Low	Negligible	High	High	High	Above 40°C	20 – 25°C
Bundle sheath	Mesophyll	Low	High	Low	Low	Low	Low	0°C	10°C
Bundle sheath	Bundle sheath	High	High	High	Low	Low	High	50°C	40°C

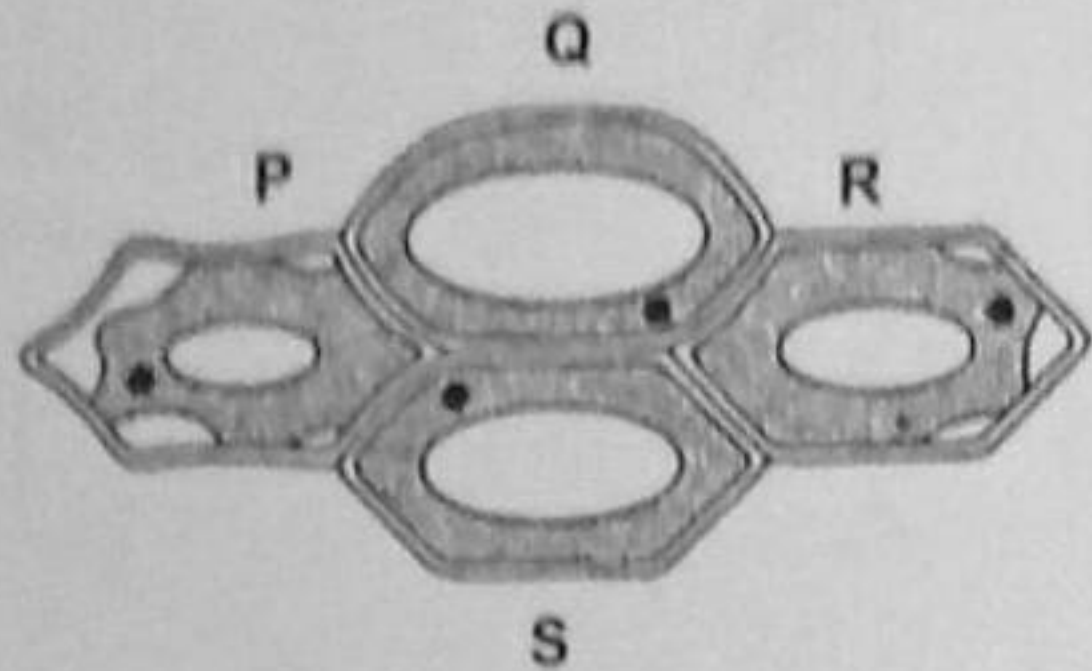
49. A bacterial strain used in a commercial fermenter converts substance P to substance Q using enzyme Y. The same strain also contains enzyme Z which converts substance Q to substance P. For each molecule of substance P, one molecule of substance Q is produced and *vice versa*. The relative activities of enzymes Y and Z are shown in the given graph.



At which of the following temperatures should the bacterial strain be kept to maximize the production of substance Q?

- (A) 10°C
- (B) 35°C
- (C) 20°C
- (D) 25°C

50. The given figure shows four plant cells P, Q, R and S. In which cells no wall pressure exists?



(A) P and Q

(B) Q and S

(C) P and R

(D) R and S