

Answer
X-C

PRE-BOARD EXAMINATION—2023-24

CLASS-X

SUBJECT-SCIENCE (086)

[SET-A]

Time : 3 Hrs.

M.M. : 80

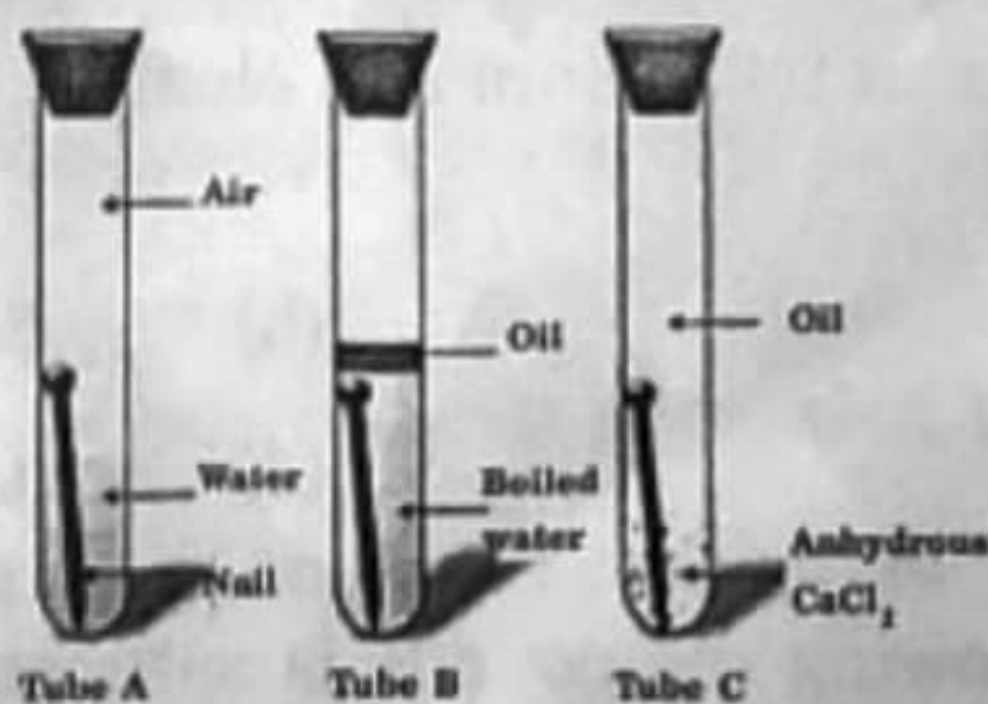
General Instructions:

- (i) This question paper consists of 39 questions in 5 sections.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) Section A consists of 20 objective type questions carrying 1 mark each.
- (iv) Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (v) Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (vi) Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vii) Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION - A

1. In which test tube, will rusting of the iron nail takes place?

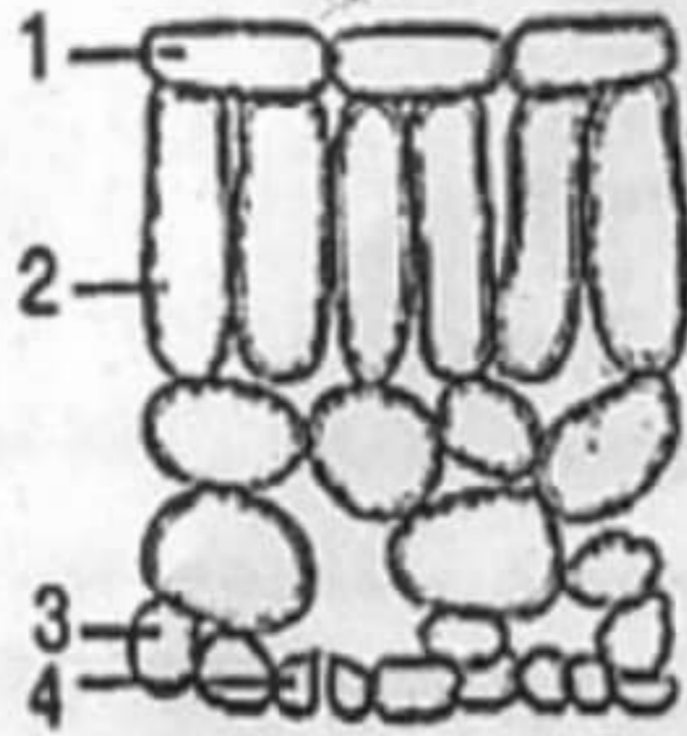
- (a) Tube A
- (b) Tube B
- (c) Tube C
- (d) All of these



(1)

2. Sheela adds 2 ml of aqueous solution of lead nitrate to 2ml aqueous solution of potassium iodide. She observes a
- (a) white precipitate of lead iodide.
 - (b) yellow precipitate of lead iodide.
 - (c) yellow precipitate of potassium nitrate.
 - (d) white precipitate of potassium nitrate. (1)
3. The pH of a solution which shows no colour change with red and blue litmus solution is
- (a) 9
 - (b) 7
 - (c) 5
 - (d) 3 (1)
4. To obtain zinc from its oxide, we reduce the oxide by
- (a) heating with coke.
 - (b) strong heating in air .
 - (c) electrolysis of molten zinc oxide .
 - (d) strong heating in absence of air. (1)
5. What do you observe when alkaline KMnO_4 is added to warm ethanol initially?
- (a) solution turns pink.
 - (b) The pink colour of KMnO_4 disappears.
 - (c) solution turns black due to formation of MnO_2 .
 - (d) No change. (1)
6. An oxide of an element 'X' reacts with dilute HCl solution to form a chloride salt and water. On reaction with sodium hydroxide solution, the oxide forms another complex salt (of sodium and element X) and water. The nature of the oxide is
- (a) Acidic
 - (b) Basic
 - (c) Amphoteric
 - (d) neutral (1)
7. Which of the following compounds is saturated?
- (a) CH_4
 - (b) C_2H_4
 - (c) C_3H_6
 - (d) C_2H_2 (1)

8. The diagram shows the arrangement of cells inside the leaf of a green plant.



- Which of the following cells normally contain chloroplasts?
- (a) 2 and 4 (b) 2 and 3
(c) 1 and 2 (d) 1 and 4 (1)
9. Fall of mature leaves and fruits from plants is triggered by which of the following substances?
- (a) Auxin (b) Cytokinin
(c) Gibberellin (d) Abscisic acid (1)
10. Vegetative propagation refers to formation of new plants from
- (a) stem, flowers and fruits
(b) stem, leaves and flowers
(c) stem, roots and flowers
(d) stem, roots and leaves (1)
11. The statement that correctly describes the characteristic(s) of a gene is:
- (a) An individual in a given species, a specific gene is located on a particular chromosome.
(b) A gene is not the information source of making proteins in the cell.
(c) Each chromosome has only one gene located all along its length.
(d) All the inherited traits in human beings are not controlled by genes. (1)

12. What are the products obtained by anaerobic respiration in plants?

- (a) Lactic acid + Energy
- (b) Carbon dioxide + Water + Energy
- (c) Ethanol + Carbon dioxide + Energy
- (d) Pyruvate

(1)

13. Which of the given statements is not true, regarding the electrical set-up for the verification of Ohm's law:

- (a) The voltmeter is connected in parallel with the known resistance
- (b) The ammeter is connected in series circuit
- (c) The rheostat can only increase the resistance in electric circuit
- (d) The single key is used to switch on/off the electric circuit

(1)

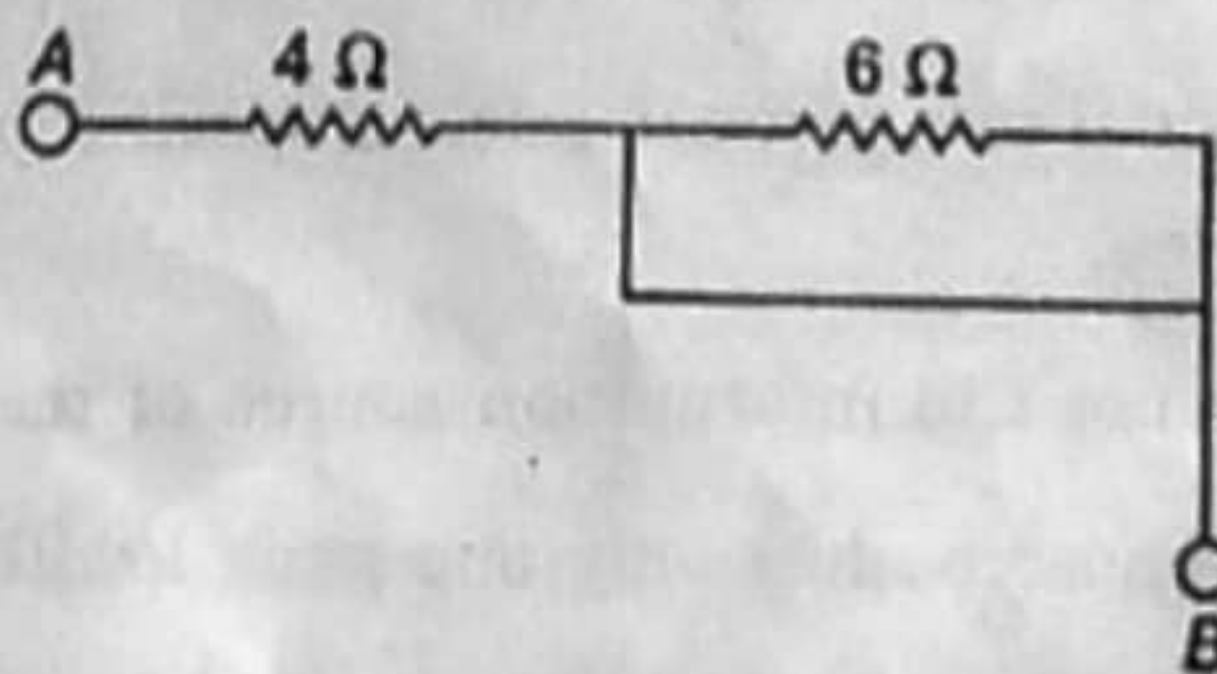
14. The magnetic lines of force, inside a current carrying solenoid, are

- (a) Along the axis and are parallel to each other
- (b) Perpendicular to the axis and equidistant from each other
- (c) Circular and they do not intersect each other
- (d) Circular at the ends but they are parallel to the axis inside the solenoid.

(1)

15. The effective resistance between A and B is

- (a) 4Ω
- (b) 6Ω
- (c) May be 10Ω
- (d) Must be 10Ω



(1)

16. The front face of a circular wire carrying current behaves like a north pole, The direction of current in this face of the circular wire is:
- (a) clockwise (b) downwards
(c) anticlockwise (d) upwards (1)

Q. no 17 to 20 are Assertion - Reasoning based questions.

These consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

17. **Assertion (A)** : Combustion of methane is an oxidation reaction.

Reason (R) : A lot of heat is released during combustion of methane. (1)

18. **Assertion (A)** : Sexual reproduction results in greater genetic variation among offspring.

Reason (R) : Sexual reproduction involves the fusion of gametes from two different parents, leading to genetic recombination. (1)

19. **Assertion (A)** : The anaerobic respiration which takes place in yeast, has one of the end products as an acid.

Reason (R) : During anaerobic respiration, there is incomplete breakdown of glucose. (1)

20. **Assertion:** A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire.

Reason (R) : Strength of a magnetic field decreases as one moves away from a current carrying conductor. (1)

SECTION - B

21. What causes tooth decay? How does brushing your teeth with toothpaste help in preventing tooth decay?

OR

What causes hyperacidity in your stomach? How can it be treated? Explain. (2)

22. Draw a neat and well labelled diagram showing pollen germination on stigma.(2)

23. (a) Name the part of the human excretory system where nephrons are found also mention one of its functions (2)

(b) State the function of Bowman's capsule and Glomerulus.

OR

Why do mammals and birds have four chambered heart? (Any two points of significance).

24. Write the sequence of events that involves the response of a person when a dust particle is inhaled through the nose by him. (2)

25. Due to gradual weakening of the ciliary muscles and diminishing flexibility of the eye lens, a certain defect of vision arises. Explain the structure and function of the type of lens required to improve the vision. (2)

OR

What is meant by scattering of light? Use this phenomenon to explain why the clear sky appears blue?

26. In the following food chain, if 50 J of energy was available to the hawk, how much energy would have been present at the first and third trophic levels? Justify your answer.

Grass → Grasshopper → Frog → Snake → Hawk

(2)

SECTION - C

Differentiate between exothermic and endothermic reactions with the help of an example for each. Write balanced chemical equations for the reactions. (3)

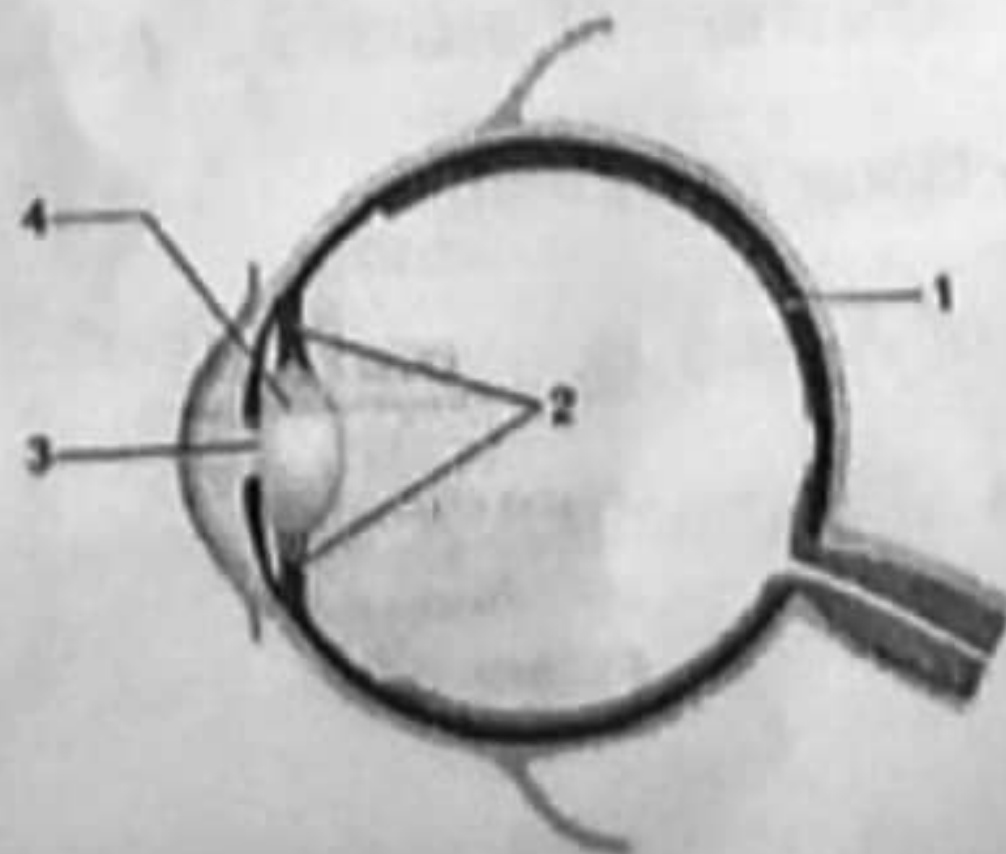
Give reason:

- (a) Even if the zinc coating is broken, the galvanised iron object remains protected against rusting.
- (b) Potassium is stored under kerosene.
- (c) Sulphide ores need to be first roasted for extraction of the metal. (3)

- (a) State the role of ATP in cellular Respiration.
- (b) What ensures sufficient exchange of gases in plants?
- (c) State the conditions on which direction of diffusion of gases in plants depend upon. (3)

The image formed by a spherical mirror is real, inverted and is of magnification, $m = -2$. If the image is at a distance of 30cm from the mirror, where is the object placed? Find the focal length of the mirror. Also state the nature of the mirror. (3)

- (a) When do we consider a student sitting in the class to be myopic?
- (b) Name the four parts labelled as 1,2,3 and 4 in the given diagram. (3)



- (a) Draw the pattern of magnetic field lines due to a magnetic field through and around a current carrying circular loop.
- (b) State the rule to find out the direction of the magnetic field inside and outside the loop.

OR

- (a) Draw a well labelled diagram to show the magnetic field pattern around current carrying solenoid.
- (b) What would happen to the magnetic field, when current through the solenoid is reversed? (3)
- (a) Write the essential function performed by ozone at the higher levels of the Earth's atmosphere.
- (b) How is it produced?
- (c) Name the synthetic chemical mainly responsible for the drop of Ozone in the atmosphere. How can the use of these chemicals be reduced? (3)

SECTION - D

Shristi heated Ethanoic acid with a compound 'A' (C_2H_6O) in presence of a few drops of concentrated sulphuric acid and observed that a sweet smelling compound 'B' is formed. When B is treated with sodium hydroxide it gives back A and a compound 'C'.

- (a) Write IUPAC names of A, B and C.
- (b) Draw electron dot structure of ethanoic acid.
- (c) Name the two reactions involved.
- (d) State any one use of A and B.
- (e) How many isomers of compound A are possible? (5)

OR

- (a) State two major differences between soaps and detergents.
- (b) Draw a labeled diagram of a micelle.
- (c) Write a chemical equation for hydrogenation of ethene. Give one industrial application of hydrogenation.

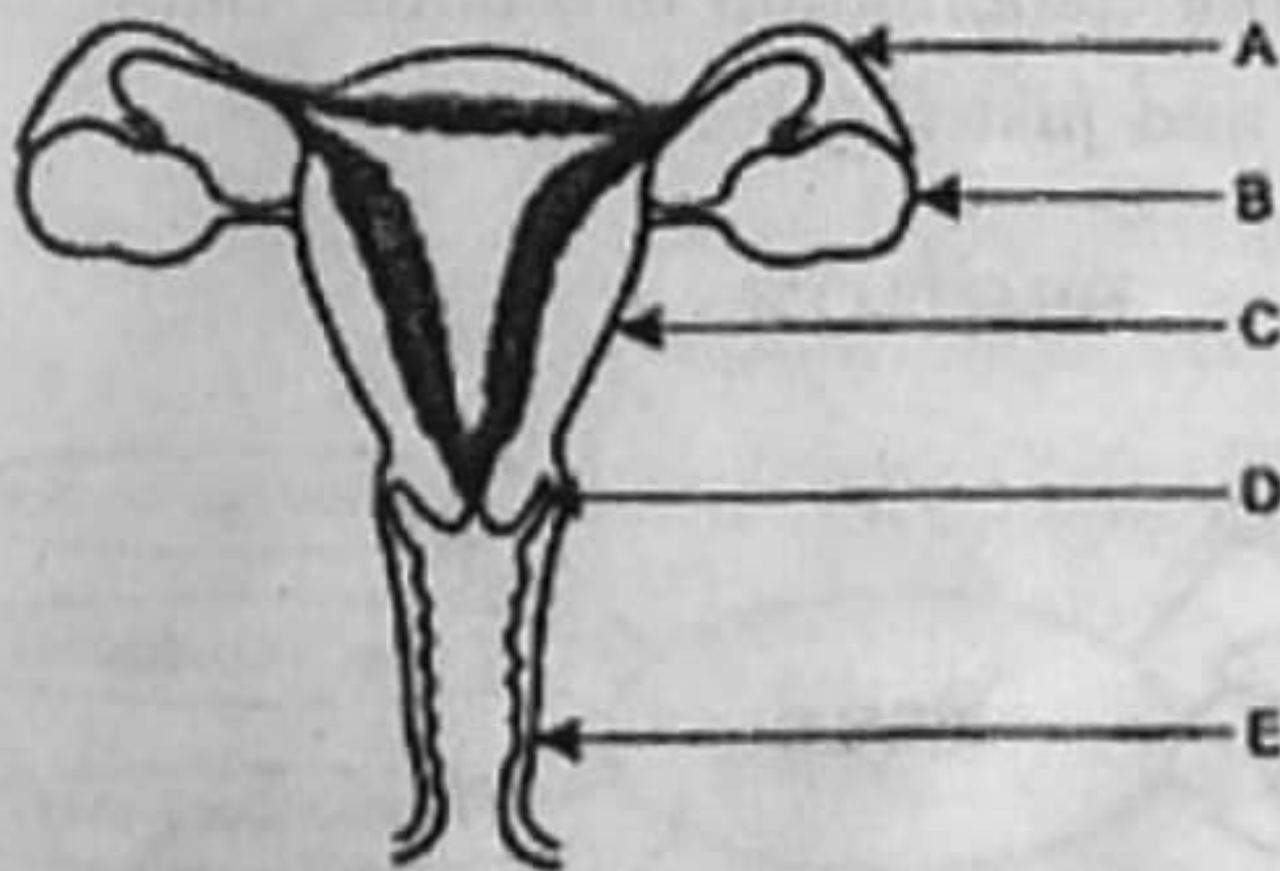
(A) Mention the role of the following organs of human male reproductive system: (5)

- (a) Testis
- (b) Scrotum
- (c) Vas- deferens
- (d) Seminal vesicle

(B) What is placenta? State its function in human females.

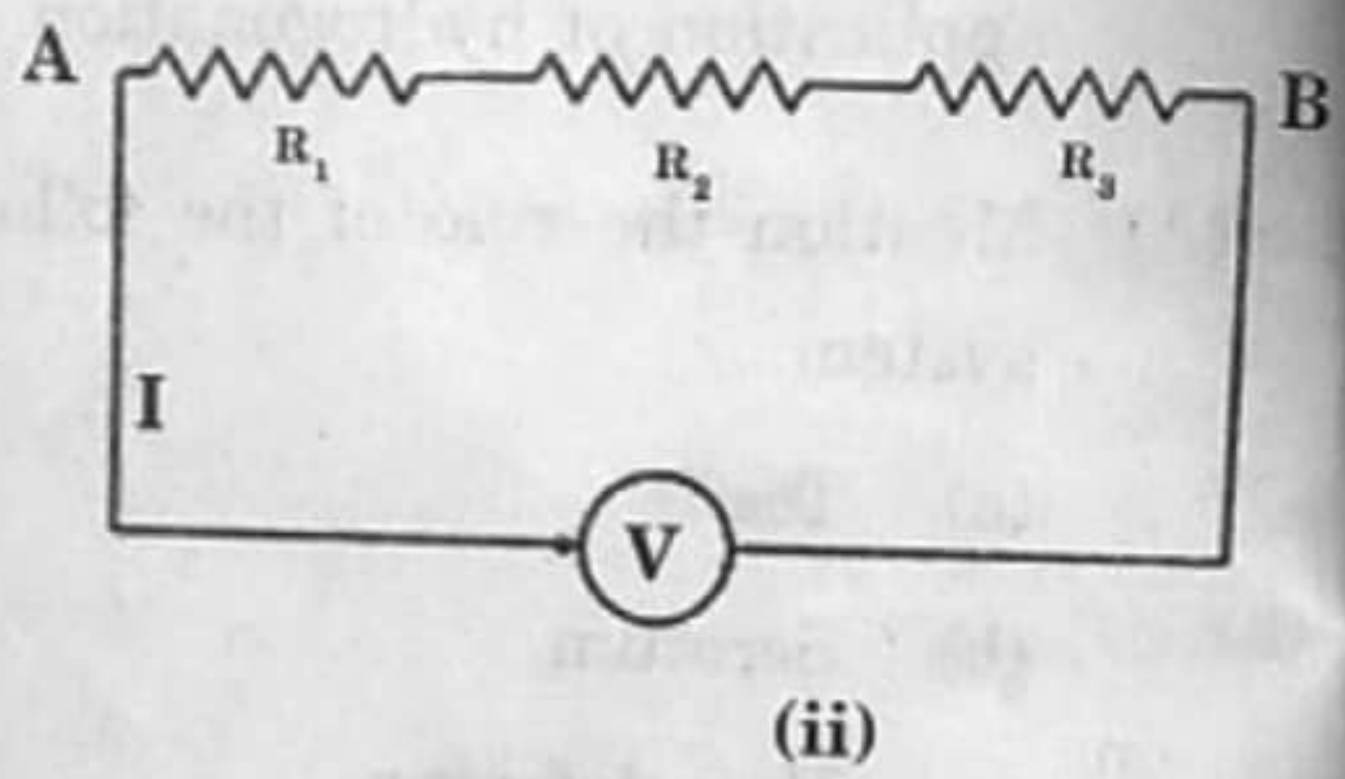
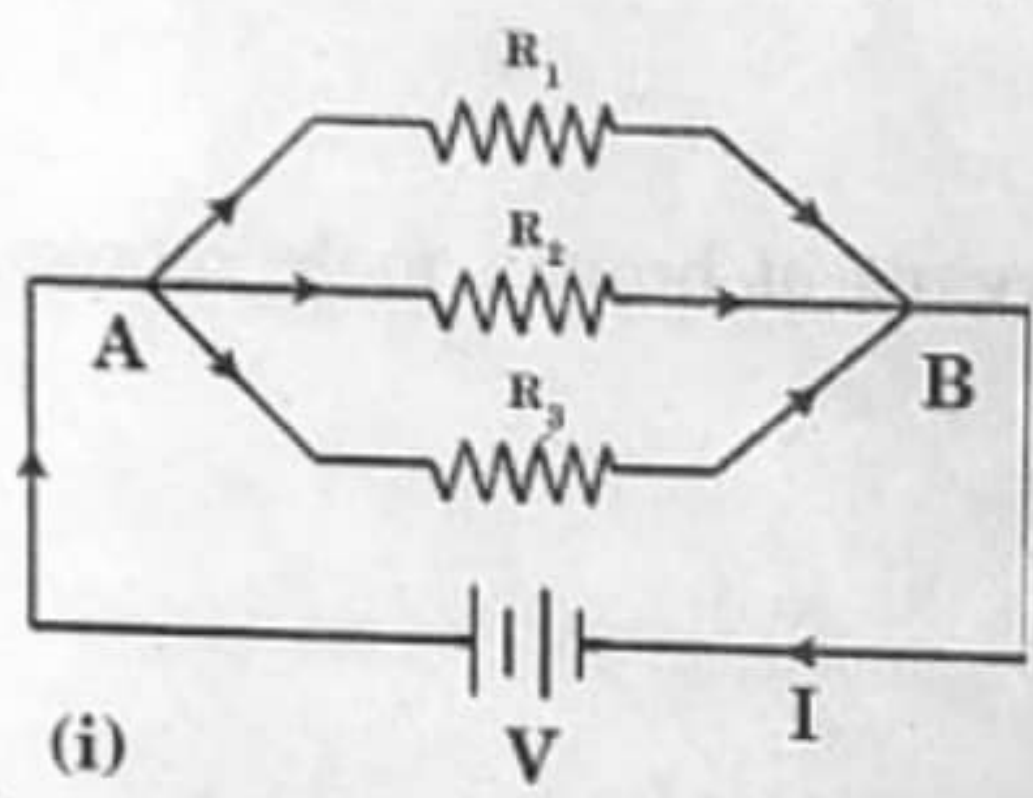
OR

- (a) Identify the given diagram.
- (b) Mention alphabet and label the following parts:
 - (i) Site of fertilisation in humans.
 - (ii) Releases hormones responsible for onset of sexual maturation .
 - (iii) Implantation of embryo takes place here.

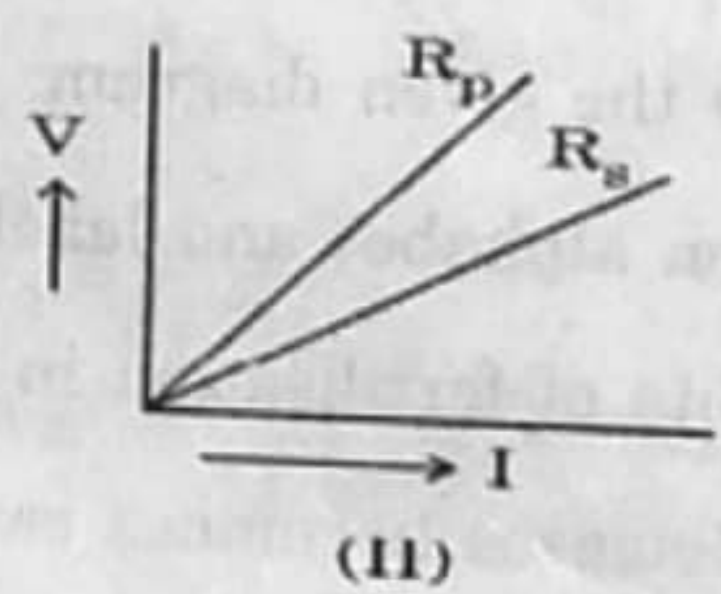
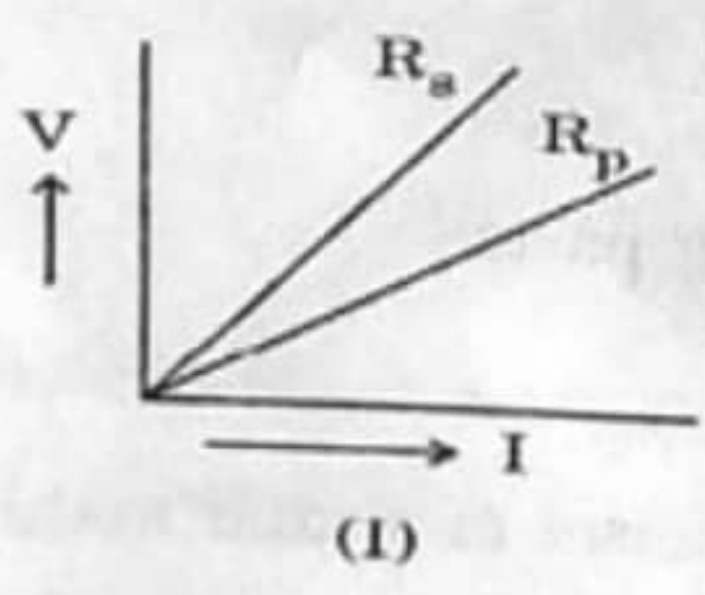


- (c) List three advantages of adopting contraceptive measures.

36. (a) Write the formula for determining the equivalent resistance between A and B of the two combinations of (i) and (ii) of three resistors R_1 , R_2 and R_3 arranged as follows:

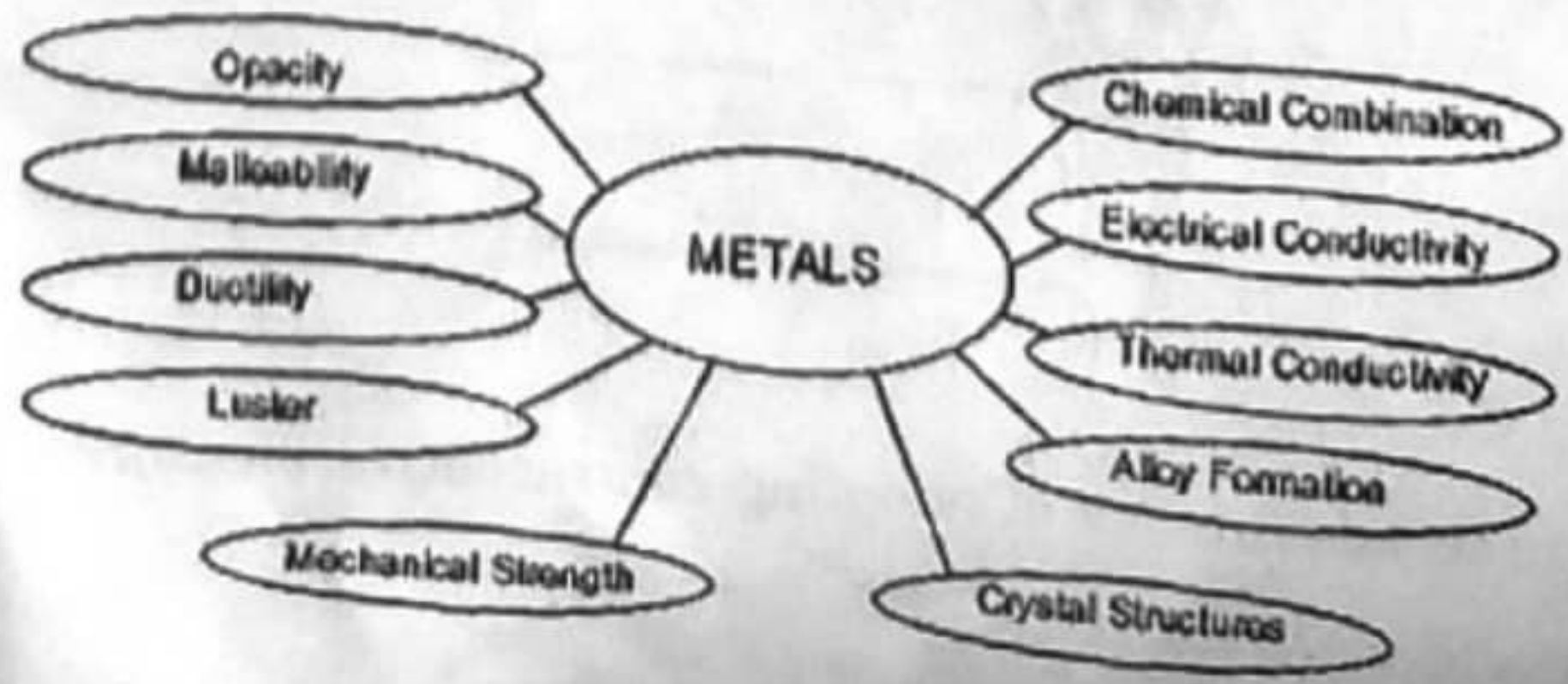


(b) If the equivalent resistance of the arrangements (i) and (ii) are R_s and R_p respectively, then which of the following V-I graph is correctly labelled? Justify your answer.



(c) Three 2 ohm resistors A, B and C are connected in such a way that the total resistance of the combination is 3 ohm. Show the arrangement of the three resistors and justify your answer.

SECTION - E



37.

Answer the following questions on the basis of the mind map given: (1+1+2=4)

- (a) Mercury is an exception to which two properties of metals ?
- (b) Name a non metal which i) conducts electricity ii) is lustrous
- (c) Why are gold and platinum used to make jewellery? (4 points)

OR

- (c) Differentiate between metals and nonmetals on the basis of physical properties. (4 points) (4)

In order to trace the inheritance of traits Mendel crossed Pea plants having one contrasting character or a pair of contrasting characters. When he crossed pea plants having round and yellow seeds with pea plants having green and wrinkled seeds, he observed that no plants with wrinkled green appeared in F1 generation. When F1 generation plants were cross bred by self-pollination, the F2 generation had seeds with different combinations of shape and colour also.

- (a) Write any two pairs of contrasting characteristics of Pea plant used by Mendel other than those mentioned above.
- (b) Differentiate between dominant and recessive traits.
- (c) State the combinations (phenotypes) observed in the seeds of F2 generation (in the above case). What do you interpret from this result?

OR

- (c) Given below is a cross between a axially placed flower pea plant (A) and a terminally placed flower pea plant (a).

Diagrammatically explain what type of progeny is obtained in F1 generation and F2 generation:

Axially placed flowered plant X Terminally placed flowered plant. (1+1+2=4)
(AA) (aa)

39. A lens is a piece of transparent material bounded by two curved surfaces. There are two types of lenses - convex and concave lens. Convex lens is made of transparent material bounded by two spherical surfaces such that it is thicker at the middle and thinner at the edges. Concave lens is also made of a transparent material that is thicker at the edges and thinner at the middle. A convex lens converges a parallel beam of light to the other side whereas concave lens spreads out. (1+1+2=4)

- (a) How will the image formed by a convex lens be affected if the upper half of the lens is wrapped with the black paper?
- (b) A small electric lamp is placed at the focus of the convex lens. What is the nature of the beam of light produced by the lens? Show with the help of a diagram.
- (c) A convex lens of focal length 20 cm can produce a magnified virtual as well as real image. Is this a correct statement? If yes, where shall the object be placed in each case for obtaining these images?

OR

- (c) How are power and focal length of a lens related? You are provided with two lenses of focal length 20 cm and 40 cm respectively. Which lens will you use to obtain more convergent light?

□□□