

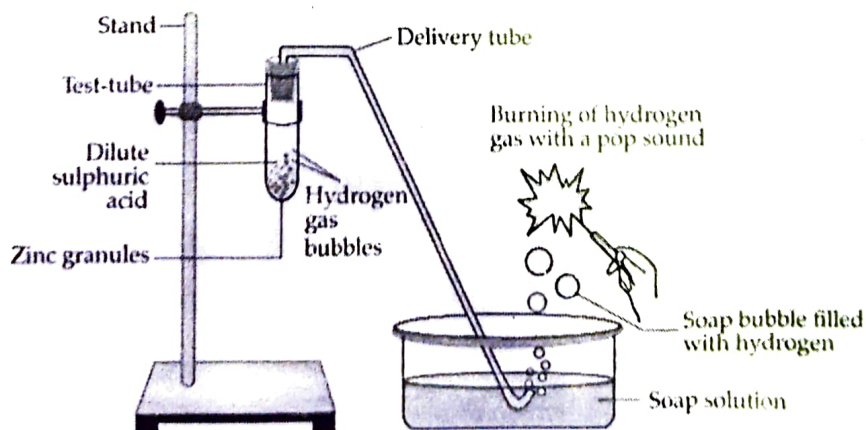
HALF YEARLY EXAMINATION-2024-25**CLASS-X****SUBJECT-SCIENCE (086)****Time : 3 Hours****M.Marks : 80****General Instructions:**

- (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 2 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 3 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 5 marks each. Answers to questions should be in the range of 80 to 120 words.
- (vii) Section-E consists of 3 source-based/case-based questions of 4 marks each with sub-parts.

SECTION-A

1. The given experimental set up shows reaction between metal and acid- (1)

Study the given experimental set-up and answer the following question.



4. Electrical wires have a coating of an insulating material. The material, generally used is- (1)

- (a) PVC (b) Graphite
(c) Sulphur (d) All can be used

5. The table provides the pH value of four solutions P, Q, R and S- (1)

Solution	pH values
P	2
Q	9
R	5
S	11

Which of the following correctly represents the solutions in increasing order of their hydronium ion concentration?

- (a) $P > Q > R > S$ (b) $P > S > Q > R$
(c) $S < Q < R < P$ (d) $S < P < Q < R$

ALTERNATIVE QUESTION FOR VISUALLY CHALLENGED STUDENTS

The pH value of four solutions P, Q, R and S are 2, 9, 5 & 11 respectively.

Which of the following correctly represents the solutions in increasing order of their hydronium ion concentration?

- (a) $P > Q > R > S$ (b) $P > S > Q > R$
(c) $S > Q > R < P$ (d) $S < P < Q < R$

6. The metals that float when treated with water are: (1)

- (a) Manganese and sodium (b) Sodium and calcium
(c) Magnesium and sodium (d) Magnesium and calcium

7. In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution: (1)

- (i) Exchange of atoms takes place
- (ii) Exchange of ions takes place
- (iii) A precipitate is produced
- (iv) A soluble salt is produced

The correct option is

- (a) (i) & (iv)
- (b) (ii) & (iii)
- (c) Only (iii)
- (d) Only (iv)

8. Which of the following are tropic movements in plants? (1)

- (i) Capturing of insects by venus fly trap leaf
- (ii) Growing of roots towards gravity
- (iii) Drooping of touch-me-not leaflets on touch
- (iv) Movement of pollen tubes towards chemicals

- (a) i and ii
- (b) ii and iii
- (c) i and iii
- (d) ii and iv

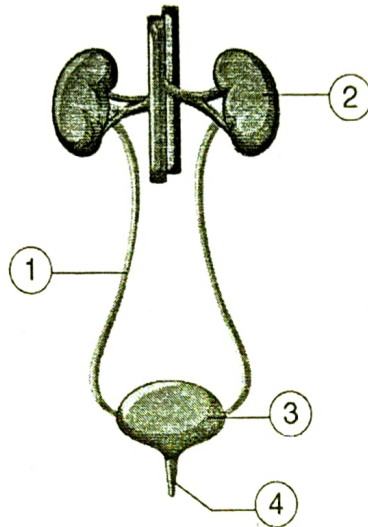
9. Which part of the brain controls activities like walking in a straight line or riding a bicycle? (1)

- (a) Cerebrum
- (b) Cerebellum
- (c) Medulla
- (d) Spinal cord

10. The blood vessel that carries oxygenated blood to the body parts is- (1)

- (a) Aorta
- (b) Vena Cava
- (c) Pulmonary vein
- (d) Pulmonary arteries

11. The given image shows the excretory system in humans. What is the importance of the part labelled as 4 in the excretory system? (1)
- (a) It purifies the blood and produces urine.
 - (b) It stores the urine till urination.
 - (c) It carries urine to the urinary bladder
 - (d) It releases the urine outside the body



ALTERNATIVE QUESTION FOR VISUALLY CHALLENGED STUDENTS

In the excretory system of human beings, some substances in the initial filtrate such as glucose, water, etc. are selectively reabsorbed in—

- (a) urethra
 - (b) nephron
 - (c) ureter
 - (d) urinary bladder
12. In the experimental set-up to show that CO_2 is released during respiration, KOH has been kept in the flask to— (1)
- (a) react with water to generate oxygen.
 - (b) create a dry atmosphere for wet germinating seeds.
 - (c) absorb carbon dioxide so as to create a partial vacuum.
 - (d) remove impurities present in the air in the flask.

13. The maximum resistance which can be made using four resistors each of resistance 0.5Ω is- (1)
- (a) 1Ω (b) 2Ω (c) 2.5Ω (d) 8Ω
- $0.5 + 0.5 + 0.5 + 0.5$
|
 2

14. An electric appliance is rated 220 V and 100 W . When it is operated on 110 V , the power consumed will be- (1)
- (a) 100 W (b) 75 W (c) 50 W (d) 25 W
- $P = VI$
 V (V) (P) I=?
 $V, I \text{ (above)}, P=?$
 $P =$

15. The strength of magnetic field inside a long current carrying solenoid is-
- (a) less at the ends than at the centre
(b) minimum in the middle
(c) same at all points
(d) found to increase from one end to the other.

16. In which mode of nutrition an organism derives its food from the body of another living organism without killing it? (1)
- (a) Saprophytic nutrition (b) Parasitic nutrition
(c) Holozoic nutrition (d) Autotrophic nutrition

Q. No. 17 to 20 are Assertion- Reason based questions. These consist of two statements- Assertion (A) and Reason (R). Answer these questions by 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 but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

$P = VI$
 $\frac{P}{V} = \frac{100}{220} = \frac{5}{11}$

17. **Assertion:** Failure of secretion of growth hormone from an early age causes dwarfism in the patient. (1)

Reason: Growth hormone stimulates the body growth and the elongation of long bones.

18. **Assertion:** White silver chloride turns grey in sunlight. (1)

Reason: Decomposition of silver chloride in presence of electricity takes place to form silver metal and chlorine gas.

19. **Assertion:** The large intestine is the largest part of the alimentary canal. (1)

Reason: Tiger has a shorter small intestine as compared to that of a cow.

20. **Assertion:** A cell is a device that converts chemical energy into electrical energy. (1)

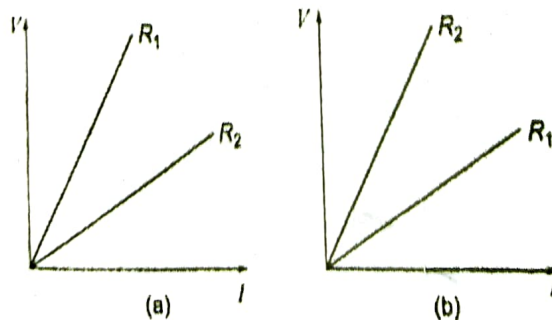
Reason: Cell maintains a constant potential difference between its terminals.

SECTION-B

21. Differentiate between direct current and alternating current. (Any two points) (2)

22. A piece of wire of resistance R is cut into three equal parts. These parts are then connected in parallel and the equivalent resistance of this parallel combination is R_1 . Find the ratio $R_1 : R$. (2)

23. Two students perform experiments on two given resistors R_1 and R_2 and plot the following V-I graphs given below. If $R_1 > R_2$ which of the following graph correctly represents the situation on the plotted curves? Justify your answer. (2)



$$V = IR$$

$$R = \frac{V}{I}$$

$$R = \frac{\rho l}{A}$$

$$R_1 = \frac{\rho l}{3A}$$

ALTERNATIVE QUESTION FOR VISUALLY CHALLENGED STUDENTS

Should the resistance of the ammeter be low or high? Give reason for your answer.

24. A person suffering from a liver disease is advised to avoid fatty and highly acidic foods. Justify the statement giving two reasons.

OR

Depict the flowchart of cellular respiration that occurs in yeast cells.

25. All reflex actions are involuntary but all involuntary actions are not reflex actions. Give two examples to justify the statement. (2)
26. 2g of copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen is passed over the heated substance, a change is seen in it. Give the chemical equations of reactions. (2)

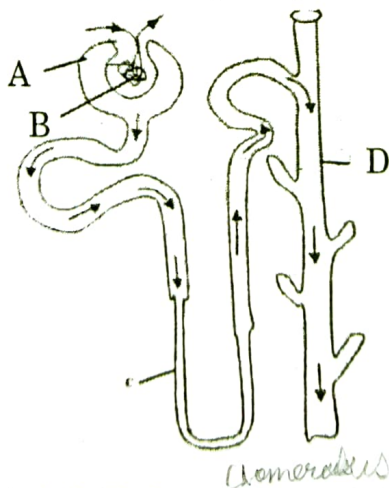
SECTION-C

27. For making a cake, baking powder is taken. If at home, your mother picks baking soda instead of baking powder in the cake- (3)
- How will it affect the taste of the cake & why?
 - How can baking soda be turned into baking powder?
 - What is the role of the component added to convert baking soda into baking powder?

OR

- Mention the pH range within which our body works. Explain how antacids give relief from acidity.
- Fresh milk has a pH of 6. How does the pH change as it turns to curd? Justify your answer.
- Mention the nature of toothpastes. How do they prevent tooth decay?

28. Rohan on heating white compound X, noticed the formation of brown fumes of gas Y along with compound lead oxide. (3)
- Identify X and Y.
 - Write the balanced chemical equation for the reaction that takes place.
 - Is it an exothermic or an endothermic reaction? Comment.
29. A biology teacher explained the characteristics of two fluids involved in the transportation of substances in the human body to her students. (3)
- According to her, Fluid A is colourless and contains less proteins and oxygen, while Fluid B is coloured and contains more proteins and oxygen.
- Identify fluid A and B.
 - Describe the movement of fluid A from the intercellular spaces to the main circulatory system with the help of a flowchart.
 - What role does fluid A play in the digestion of food in humans?
30. Explain the events that occur when growing plants detect light. Also name the plant hormone responsible for these events. (3)
31. Observe the given diagram of nephron and answer the following questions:



- Identify the parts labelled as 'B' and 'D'.
- What is the significance of the part labelled as 'B' in the diagram?
- Name any two substances in the initial filtrate that are reabsorbed in the kidney.

ALTERNATIVE QUESTION FOR VISUALLY CHALLENGED STUDENTS

Describe the three steps involved in the formation of urine.

OR

31. What will happen if:

- (a) xylem tissue in a plant is removed?
- (b) green plants disappear from the earth?
- (c) the system of blood vessels develop a leak?

lyphatic lymphatic

32. Ananya observed that the electric appliances with metallic bodies are connected to the mains through a three pin plug whereas electric bulbs can be connected with a two pin plug. Her friend explained to her that the three pin connection reduces heating of the connecting wire.

*K
Na
Ca
Mg
Al
Zn
Fe
H*

- (a) Is the explanation given by Ananya's friend correct? Justify. (3)
- (b) Write the function of a fuse in a domestic circuit.

33. (a) The cords of an electric heater don't glow while its heating element does. Give reasons for your answer. (3)

(b) A torch bulb is rated 5V and 500 mA. Calculate the-

- (i) resistance $P = V$
- (ii) energy consumed, when it is lit for 2 hours.

SECTION-D

34. (a) Account for the following:

(5)

- (i) Sodium and potassium are kept immersed in kerosene oil.
- (ii) Ionic compounds have high melting points
- (iii) School bells are made up of metals. *sonority*

(b) Write the chemical equations that show aluminium oxide reacts with (i) acid and (ii) base.

OR

$$\begin{array}{r} 36.00 \\ \times 2 \\ \hline 72.00 \end{array}$$

$$\begin{array}{r} 7.200 \\ \times 25 \\ \hline 18000 \end{array}$$

- (i) Show the formation of magnesium chloride by transfer of electrons.
- (ii) Ionic compounds in the solid state do not conduct electricity but they do so when in molten state. Give a reason,
- (iii) Write a reaction of any one metal which reacts neither with cold water nor with hot water (but react with heated steam to produce hydrogen gas).

35. (a) Define the term electric power. (5)

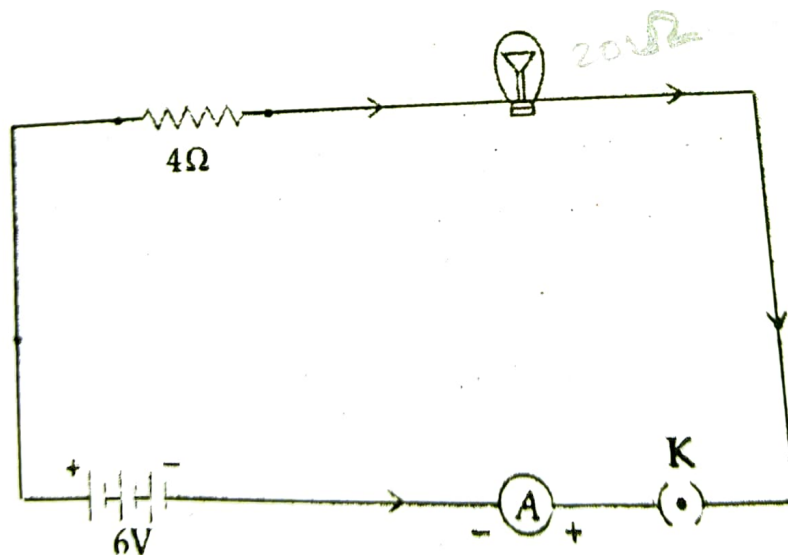
(b) Write an expression relating electric power, potential difference, and resistance. $P = VI$ $V = IR$

(c) An electric lamp of resistance 20Ω and a conductor of resistance 4Ω are connected to a $6V$ battery as shown in the circuit. Calculate—

(i) the total resistance of the circuit. 24

(ii) the potential difference across the electric lamp. $V = IR$

(iii) power of the lamp. $P = VI$



ALTERNATE QUESTION FOR VISUALLY CHALLENGED STUDENTS

(c) How many 132Ω resistors in parallel are required to carry $5A$ on a $22V$ line?

OR

- (a) State Ohm's law.
- (b) Define the SI unit of electric current.
- (c) If the length and area of the cross section of the wires made of the same material at the same temperature are shown below.

Wire	Length	Area of cross section
P	L	A
Q	2L	A/2
R	L/2	2A

Arrange the wire P, Q and R in ascending order of resistance and resistivity. Justify your answer.

ALTERNATE QUESTION FOR VISUALLY CHALLENGED STUDENTS

- (c) If the length and area of the cross section of the wire are doubled, how does the resistance and resistivity of the wire change? Justify.
36. (a) What are Variegated leaves? Give two examples of plants having such leaves. (5)
- (b) Design an activity to show that chlorophyll is essential for photosynthesis. (5)

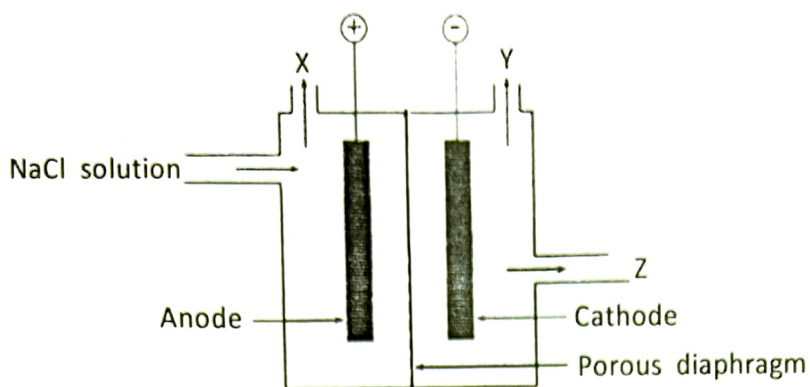
OR

Plants do not have excretory organs. How do they get rid of their excretory products? Explain. (5)

SECTION-E

37. Read the following passage and answer the questions that follow: (4)

In the diagram given below, when electricity is passed through an aqueous solution of a common salt, a substance 'Z' is produced along with the evolution of gases 'X' and 'Y'. When a burning matchstick is brought near the gas 'Y' it burns with a pop sound, whereas X is used for disinfecting drinking water. When gas 'X' is passed through a solution of slaked lime, an insoluble substance 'A' is produced. *(Handwritten: Ca(OH)2)*



- (i) Write the names of gases 'X' and 'Y'.
- (ii) Write the balanced chemical equation for the formation of substance 'A'.
- (iii) Write your observations:
 - (a) If a drop of blue litmus solution is added to the aqueous solution of substance 'Z'
 - (b) If methyl orange is added to substance 'Z'.

OR

Write a balanced chemical reaction that takes place when 'X' and 'Y' react with each other. The product so produced will turn blue litmus red only when wet, why?

ALTERNATIVE QUESTION FOR VISUALLY CHALLENGED STUDENTS

When electricity is passed through an aqueous solution of sodium chloride, three products are obtained.

- (i) Name the products obtained during the process.
- (ii) Name the process involved when electricity is passed through an aqueous solution of sodium chloride and why is it called so?
- (iii) Which by-product of the above process is used for manufacturing bleaching powder? Give the chemical reaction involved to justify your answer.

Both JA QB lower JC upper JD no.

38. To demonstrate the transpiration from the leaf surface, Sahil took four leaves of the same plant. He applied vaseline to both the surfaces of leaf A, lower surface of leaf B, upper surface of leaf C. He did not apply vaseline on leaf D. Leaves were hung in bright sunlight so that they can transpire freely. After few hours, he recorded the following observations—

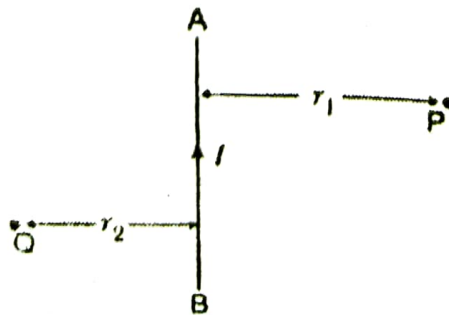
- (i) The initial and the final mass of leaf A remained the same.
- (ii) The final mass of leaf B was less than its initial mass.
- (iii) The final mass of leaf C was also less than its initial mass.
- (iv) The difference in the initial and final mass of leaf D is more than that of leaf B and C. (4)

- (a) Was vaseline effective in preventing loss of water? Justify your answer.
- (b) From which surface of leaf maximum loss of water takes place and why?
- (c) Why does leaf D show maximum variation in the difference of mass after two hours?

OR

- (c) State two advantages of transpiration to plants.

39. Akshaya did the activity to show the magnetic field due to a current carrying straight conductor. AB is the straight conductor and P and Q are two points as shown in the figure. (4)



- (a) Draw a diagram to show the magnetic field lines due to a current carrying straight conductor.
- (b) State the rule used to determine the direction of magnetic field lines due to current carrying straight conductors.
- (c) Given $r_1 > r_2$ where will the strength of the magnetic field be larger? Give reason for your answer.

OR

- (c) If the current flowing through the conductor is doubled, how would the strength of the field be changed?

ALTERNATE QUESTION FOR VISUALLY CHALLENGED STUDENTS

- (a) Write any two properties of magnetic field lines.
- (c) Explain how the strength of the magnetic field will change if we increase the distance from the current carrying conductor.

OR

- (c) If the current flowing through the conductor is doubled, how would the strength of the field be changed?