

**Goa Board**  
**Class X Science**  
**Term 1**  
**Sample Paper - 4**

**Time: 3 hrs**

**Total Marks: 90**

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**General Instructions:**

1. The question paper comprises two Sections, A and B. You are to attempt both the sections.
  2. All questions are compulsory.
  3. All questions of **Section A** and all questions of **Section B** are to be attempted separately.
  4. Question numbers **1 to 3** in **Section A** are **one mark** questions. These are to be answered in **one word** or in **one sentence**.
  5. Question numbers **4 to 6** in **Section A** are **two marks** questions. These are to be answered in about **30 words** each.
  6. Question numbers **7 to 18** in **Section A** are **three marks** questions. These are to be answered in about **50 words** each.
  7. Question numbers **19 to 24** in **Section A** are **five marks** questions. These are to be answered in about **70 words** each.
  8. Question numbers **25 to 33** in **Section B** are multiple choice questions based on practical skills. Each question is a **one mark** question. You are to select one most appropriate response out of the four provided to you.
  9. Question numbers **34 to 36** in **Section B** are questions based on practical skills and are two marks questions.
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**SECTION A**

- Q. 1** Hydrogen is a highly inflammable gas and oxygen is a supporter of combustion, yet water which is a compound made of hydrogen and oxygen is used to extinguish fire. Why? (1)
- Q. 2** What is the commercial unit of energy? (1)
- Q. 3** What are wind energy farms? (1)
- Q. 4** Why do metals displace hydrogen from acids? Give an example of such displacement. (2)
- Q. 5** The charge possessed by an electron is  $1.6 \times 10^{-19}$  coulomb. Find the number of electrons which will flow per second to constitute a current of 1 ampere. (2)

**Q. 6** Name the enzyme found in saliva. State the role of saliva in the digestion of food. (2)

**Q. 7** Give one equation each for decomposition reactions where energy is supplied in the form of (i) heat, (ii) light and (iii) electricity. (3)

**Q. 8** Explain electrolytic decomposition of water. How can we identify the products formed? (3)

**Q. 9** What is the chlor alkali process? Give two uses of NaOH obtained from this process? (3)

**Q. 10** (3)

(i) Name the compound which is obtained from baking soda and is used to remove the permanent hardness of water.

(ii) Write its chemical formula.

(iii) What happens when it is recrystallised from its aqueous solution?

**Q. 11** Write chemical equations for the reactions taking place when (3)

(i) Zinc sulphide is heated in air

(ii) Zinc carbonate is calcined

(iii) Manganese dioxide is heated with aluminium powder

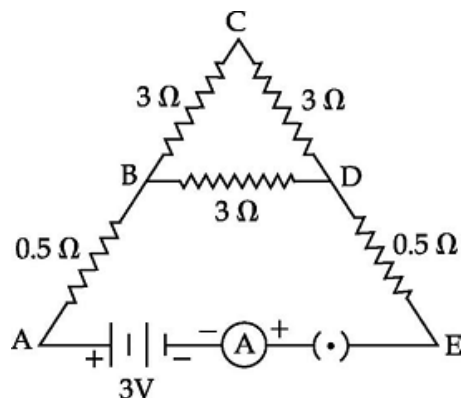
**Q. 12** (3)

(a) Why are copper or aluminium wires generally used for electrical transmission and distribution purposes?

(b) Two wires, one of copper and the other of manganin, have equal lengths and equal resistances. Given that the resistivity of copper is lower than that of manganin, which wire is thicker?

**Q. 13** Write the sequence of events taking place in a biogas plant. (3)

**Q. 14** Five resistors are connected in a circuit as shown. Find the ammeter reading when the circuit is closed. (3)



- Q. 15** Why does a current-carrying conductor kept in a magnetic field experience force? On what factors does the direction of this force depend? Name and state the rule used for the determination of direction of this force. (3)
- Q. 16** Some teenagers come under bad influences with peer group pressure. (3)
- (i) Why do teenagers readily come under this influence?
  - (ii) Suggest measures to overcome such problems in teenagers.
  - (iii) What should we learn from this?
- Q. 17** Two identical immersion heaters are to be used to heat water in a large container. Which one of the following arrangement would heat the water faster? (3)
- (i) Connecting the heaters in series with the main supply, or
  - (ii) Connecting the heaters in parallel with the main supply?
- Give reasons for your answer.
- Q. 18** (3)
- (a) Name any two exhaustible sources of energy.
  - (b) Would you consider hydrogen to be a cleaner and more efficient fuel than CNG? If yes, why is it not used in everyday life?
- Q. 19** (5)
- (a) Write word equations and then balanced equations for the reaction taking place when
    - (i) Dilute sulphuric acid reacts with zinc granules
    - (ii) Dilute hydrochloric acid reacts with magnesium ribbon
  - (b) What is the difference between hydrated salts and anhydrous salts?
  - (c) Give two important uses of washing soda.
- Q. 20** Explain with an example how the metal X which is low in reactivity series and metal Y which is high in reactivity series are obtained from their compounds by the reduction process. (5)
- (a) Write the electronic configurations of sodium and chlorine. Show the formation of sodium chloride from sodium and chlorine by the transfer of electrons.
  - (b) List any two observations when a highly reactive metal is dropped in water.
- Q. 21** (5)
- (a) What is a solenoid?
  - (b) Draw the pattern of the magnetic field produced around a current-carrying solenoid. Compare this field to that of a bar magnet.
  - (c) What happens to the magnetic field when the current through the solenoid is reversed?

**Q. 22** (5)

- (a) What is a fuse? Explain its working?
- (b) Two circular coils A and B are placed closed to each other. If the current in the coil A is changed, will some current be induced in the coil B? Give reason.

**Q. 23** (5)

- (a) Draw a diagram of the human respiratory system and label the following parts:
  - (i) Part through which air is taken in
  - (ii) Part which protects the lungs
  - (iii) Part which carries air into the lungs
- (b) What are alveoli? Mention their role in respiration.
- (c) Differentiate between aerobic and anaerobic respiration.

**Q. 24** (5)

- (i) How does control and coordination take place in plants? How does it differ from that in animals?
- (ii) Name five stimuli which act on plants. Name the type of tropic movement produced by each of these stimuli.
- (iii) Define hydrotropism with the help of an example. Explain hydrotropism with the help of a diagram.

### SECTION B

**Q. 25** When solid lead nitrate is heated in a test tube, which of the following observations is not observed during the reaction: (1)

- A. A crackling sound is produced.
- B. A light yellow solid is produced.
- C. A brown gas is produced.
- D. Explosion with a lot of heat is produced.

**Q. 26** Rohan took 4 ml of ethanoic acid in two test tubes labelled I and II. In test tube I, he dipped a strip of blue and red litmus papers. In test tube II, he added solid sodium hydrogen carbonate. He observed that the (1)

- (i) Red litmus turns blue in test tube I, and no change occurs in test tube II
- (ii) Blue litmus turns red in test tube I, and brisk effervescence occurs in test tube II
- (iii) Red litmus turns blue in test tube I, and a gas with an odour like vinegar evolved in test tube II
- (iv) Blue litmus turned red in test tube I, and a gas which supports combustion evolved in test tube II

The correct observation is

- A. (i)
- B. (ii)
- C. (iii)

D. (iv)

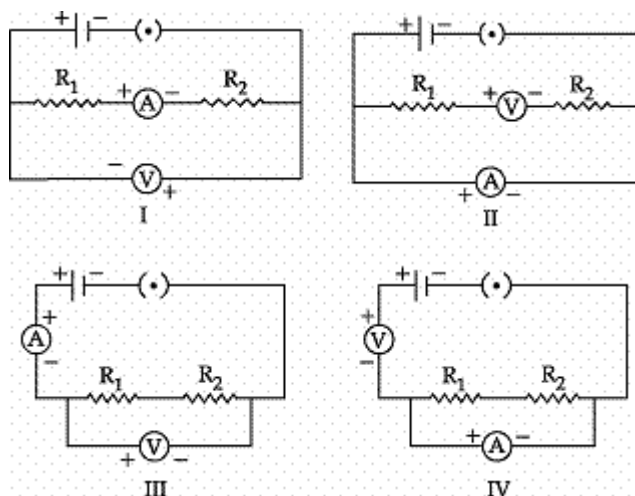
**Q. 27** When a student added acetic acid to a test tube containing sodium hydrogen carbonate, a colourless gas was evolved which was tested with a burning matchstick. It was observed that the matchstick: (1)

- (i) Continues to burn brilliantly
- (ii) Burnt slowly with a blue flame
- (iii) Extinguished immediately
- (iv) Burnt with an orange flame

The correct observation is

- A. (i)
- B. (ii)
- C. (iii)
- D. (iv)

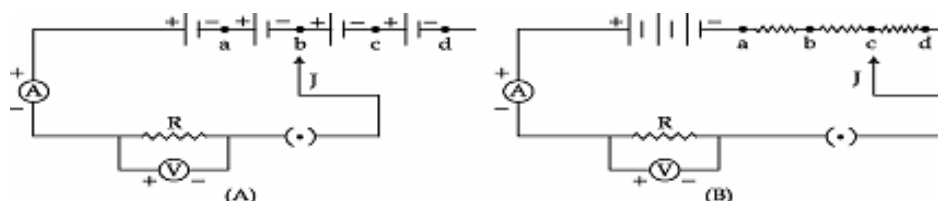
**Q. 28** In the experiment to determine equivalent resistance of two resistors  $R_1$  and  $R_2$  in series, which of the circuit diagrams shows the correct way of connecting the voltmeter? (1)



- A. I and II
- B. II and III
- C. I and III
- D. II and IV

- Q. 29** To study the dependence of current on the potential difference across a resistor, two students arranged their circuits according to the setups shown in Figures (A) and (B). They kept the contact J in four different positions marked (a), (b), (c) and (d) in the two figures.

(1)



For the two students, their ammeter and voltmeter readings will be minimum when the contact J is in the position

- A. (a) in both setups
  - B. (d) in both setups
  - C. (d) in setup (A) and (a) in setup (B)
  - D. (a) in setup (A) and (d) in setup (B)
- Q. 30** The current flowing through a resistor and the potential difference developed across its ends are shown in the figures given below. The value of resistance of the resistor is (1)



- A. 0.5 ohm
  - B. 5.0 ohm
  - C. 50 ohm
  - D. 500 ohm
- Q. 31** A voltmeter has a least count of 0.05 volt. While performing the Ohm's law experiment, a student observed that the pointer of the voltmeter coincides with the 15th division. The observed reading is (1)
- A. 0.75 V
  - B. 0.075 V
  - C. 7.5 V
  - D. 75 V

**Q. 32** An ammeter has a range of (0–3) amperes and there are 30 divisions on its scale.

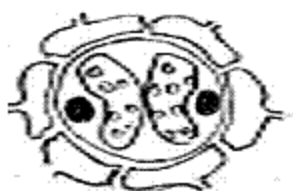
What is its least count?

(1)

- A. 1.0 A
- B. 0.001 A
- C. 0.1 A
- D. 0.01 A

**Q. 33** Given below is a diagram showing the microscopic view of epidermal tissue.

(1)

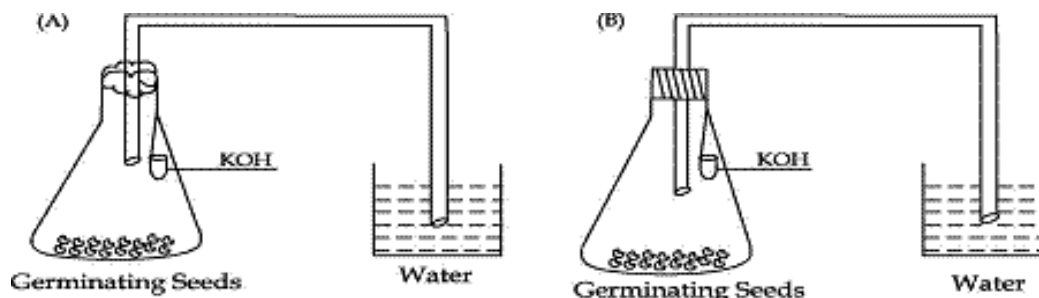


The diagram is

- A. Correct in all aspects.
- B. Incorrect because stomata are not shown.
- C. Incorrect because the guard cells are directed backwards.
- D. Correct because the two guard cells and stomata are present.

**Q. 34** Using the same number of germinating seeds, two students, A and B, set up their experiments separately. Student A used cotton wool to plug the bent tube to the mouth of the flask, while student B used an airtight rubber cork.

(2)

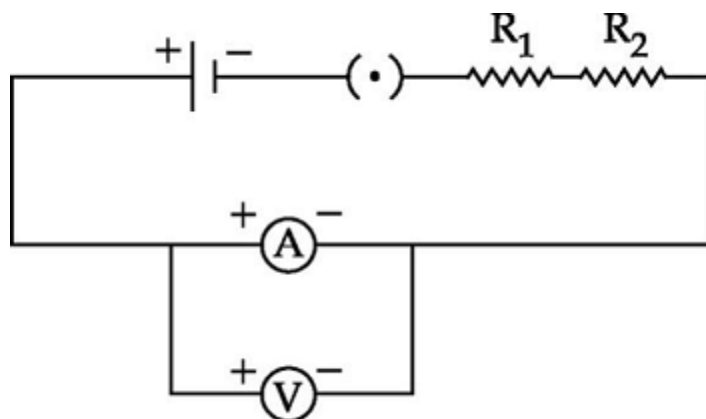


(i) What would be the observation after few hours?

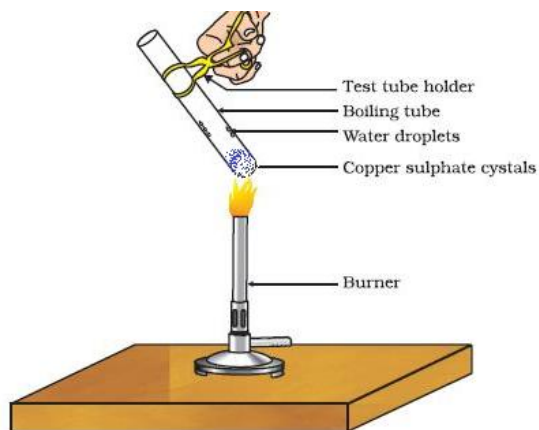
- A. The water level would rise in the bent tube of student A.
- B. The water level would rise in the bent tube of student B.
- C. The cotton plug would become wet.
- D. The water in the beaker of student B would turn milky.

(ii) What is the role of KOH?

- Q. 35** To determine the equivalent resistance of a series combination of two resistors  $R_1$  and  $R_2$ , a student arranges the following set up. (2)



- (i) Which one of the following statements will be true for this circuit? It gives
- Incorrect reading for both current  $I$  and potential difference  $V$
  - Correct reading for current  $I$  but incorrect reading for potential difference  $V$
  - Correct reading for potential difference  $V$  but incorrect reading for current  $I$
  - Correct readings for both  $V$  and  $I$
- (ii) What will happen to the reading of the ammeter if  $R_2$  is removed from the circuit?
- Q. 36** Which one of the following statements is correct when copper sulphate crystals are heated in a test tube? Why? (2)



Statements:

- It loses its water of crystallisation.
- White-coloured powder is formed.
- There will be no change in the colour of copper sulphate crystals.