

**CBSE  
Class X Science  
Sample Paper - 9**

**Time: 3 hrs.**

**Total Marks: 80**

**General Instructions:**

- The question paper comprises five sections – A, B, C, D and E. You are to attempt all the sections.
- All questions are compulsory.
- Internal choice is given in sections B, C, D and E.
- Question numbers 1 and 2 in Section A are one mark questions. They are to be answered in one word or in one sentence.
- Question numbers 3 to 5 in Section B are two marks questions. These are to be answered in about 30 words each.
- Question numbers 6 to 15 in Section C are three marks questions. These are to be answered in about 50 words each.
- Question numbers 16 to 21 in Section D are five marks questions. These are to be answered in about 70 words each.
- Question numbers 22 to 27 in Section E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

**Section A**

1. Which part of the brain is responsible for the precision of voluntary actions? (1)
2. Name the energy possessed by cooking gas and a dry cell. (1)

**Section B**

3. Aluminium is a more active metal than iron, but suffers less corrosion. Why? (2)

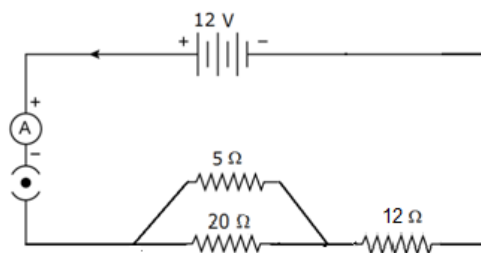
**OR**

An element X forms an oxide which turns red litmus blue. Identify whether X is a metal or non-metal.

4. What will happen if due to some accident, changes occur in the gene frequency of members of the sub-population of a species? Identify the phenomenon. (2)
5. Refractive indices of crown glass and flint glass are 1.52 and 1.66, respectively. Find the ratio of speed of light in crown glass to speed of light in flint glass. The speed of light in air is  $3 \times 10^8 \text{ms}^{-1}$ . (2)

### Section C

6. (3)
- (a) Draw a schematic labelled diagram of a closed circuit which connects all the given components in series and connected across a 12-V battery:
- (i) 20 W lamp
  - (ii) An ammeter
  - (iii) A switch
  - (iv)  $10\ \Omega/100\ \text{W}$  resistor
- (b) How much current will be shown by the ammeter in the above circuit if the lamp power is rated as 20 W at 12 V?
7. If you consume butter during lunch, how will it get digested in your body? (3)
8. What is regeneration? Explain regeneration in *Planaria* with the help of a diagram. (3)
9. (3)
- (a) How does the metallic character of elements change along a period of the periodic table from the left to the right and why?
- (b) In the modern periodic table, the element calcium (atomic number = 20) is surrounded by elements with atomic numbers 12, 19, 21 and 38. Which of these elements have physical and chemical properties resembling those of calcium and why?
10. How is sex determined in human beings? (3)
11. Three resistors of  $5\ \Omega$ ,  $10\ \Omega$  and  $20\ \Omega$ , respectively, are connected to a battery of 12 V as shown in the circuit given below. (3)



Calculate:

- (a) Current through each resistor
- (b) Total current in the circuit
- (c) Total resistance of the circuit

**OR**

An electrical appliance is rated 240 V–500 W. How much current will this appliance draw? It is planned to spend Rs 200 for running this appliance in a month. If the per unit cost is Rs 4.60, how many hours can this appliance be operated in a month of 30 days?

12. (3)

- (a) What is an ecosystem? List the two main components of an ecosystem.
- (b) We do not clean ponds or lakes on a regular basis, but an aquarium needs to be cleaned regularly. Explain.

**OR**

- (a) Give two examples of decomposers present in an ecosystem.
- (b) How is the presence of decomposers crucial in the ecosystem?

13. Mercury is the only metal found in the liquid state. It is largely used in thermometers to measure the temperature. But mercury is a very dangerous metal as its density is very high. What two precautions would you take while handling equipment containing mercury? (3)

14. Answer the following: (3)

- (a) What according to you suggests that the human eye behaves like a camera?
- (b) Suggest what type of corrective lens be used for a person with a myopic eye.
- (c) How do you determine the nature and power of the lens required for a person with myopia if the far point of the myopic eye is 80 cm?

15. Write chemical equations to show what happens when (3)

- (a) Ethanol is heated with concentrated sulphuric acid at 443 K.
- (b) Ethanol reacts with ethanoic acid in the presence of an acid acting as a catalyst.
- (c) An ester reacts with a base.

**OR**

- (a) On dropping a small piece of sodium into an organic compound 'A' with molecular formula  $C_2H_6O$  in a tube, a brisk effervescence is observed. On bringing a burning splinter, the gas evolved burns with a pop sound. Identify 'A' and write the chemical equation.
- (b) What will happen when you heat organic compound 'A' at 443 K with excess of concentrated sulphuric acid?

### Section D

16. (5)

- (a) What is electromagnetic induction? How is the direction of induced current determined?
- (b) Draw some field lines around a current-carrying circular loop wire and mark the field directions on them by showing arrows. Assume current flowing in the loop is in an anti-clockwise direction.
- (c) List a device working on the principle of electromagnetic induction. Also, list a device working on the principle of generation of force on a current-carrying conductor in the magnetic field.

**OR**

- (a) Draw the magnetic field pattern produced by the current-carrying solenoid.
- (b) On which factors do the magnitude of the magnetic field due to a circular coil depends on?
- (c) Which rule is used to determine the direction of magnetic field due to a current-carrying circular coil? Explain the rule.

**17.** (5)

- (a) What is a salt? Give the names and formulae of any two salts. Also name the acids and bases from which these salts may be obtained.
- (b) What is meant by 'a family of salts'? Explain with examples.
- (c) What is meant by 'hydrated' and 'anhydrous' salts? Explain with examples.
- (d) Write the names, formulae and colours of any two hydrated salts.
- (e) What will be the colour of litmus in an aqueous solution of ammonium chloride salt?

**OR**

- (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 a neutralisation reaction?
- (c) Give two important uses of washing soda.

**18.** (5)

- (a) What are fossils? What do they tell us about the process of evolution?
- (b) Explain with examples how the following provide evidences in favour of evolution in organisms.
- (i) Homologous organs
- (ii) Analogous organs
- (iii) Fossils

**OR**

- (a) State the role of the placenta in the development of the embryo.
- (b) List four ways of preventing pregnancy. State two advantages of using such preventive methods.

- 19.** An organic compound A is widely used as a preservative in pickles and has the molecular formula  $C_2H_4O_2$ . This compound reacts with ethanol to form a sweet-smelling compound B. (5)
- Identify compound A.
  - Write the chemical equation for its reaction with ethanol to form compound B.
  - How can we get compound A back from B?
  - Name the process.
  - Which gas is produced when compound A reacts with washing soda?
- 20.** (5)
- Cigarette smoke produces carbon monoxide. If a non-smoker smoked one pack of cigarettes a day, continuously for a few weeks, what would happen to the number of red blood cells in the blood?
  - Predict the effect on the heart if the blood flow through the anterior inter-ventricular artery is restricted or completely blocked.
- 21.** Name the type of mirrors used in (a) a search light and (b) rear view mirror. Draw labelled diagrams to show the formation of an image in each of the above two cases. Which of these mirrors could also form a magnified and virtual image of an object? Illustrate with the help of a ray diagram. (5)

### Section E

22. List two tests for experimentally distinguishing between an alcohol and a carboxylic acid and describe how these tests are performed. (2)

OR

A green-coloured hydrated metallic salt on heating loses its water of crystallisation and gives the smell of burning sulphur. Identify the salt and write down the reaction involved.

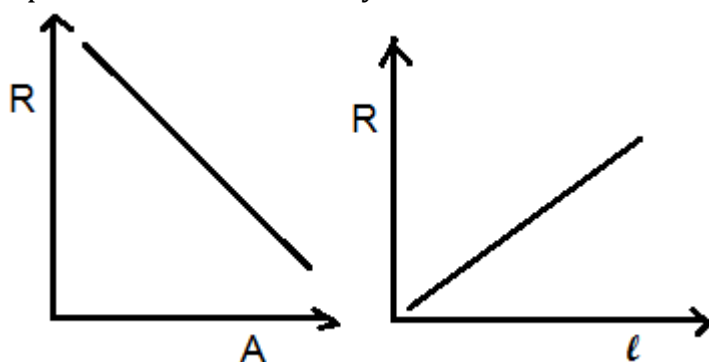
23. Write two precautions to be taken while identifying different parts of an embryo of a dicot seed. (2)

OR

A student is to conduct an experiment to show  $\text{CO}_2$  is released during respiration. List two precautions that he/she must take for obtaining correct observations. (1)

24. Name the gas evolved when zinc granules are treated/heated with  
(a) hydrochloric acid solution  
(b) sodium hydroxide solution (2)

25. The following plots show the dependence of the length of the conductor ( $\ell$ ) and cross section area ( $A$ ) of the conductor on electrical resistance ( $R$ ) of the conductor. State the dependence mathematically. (2)

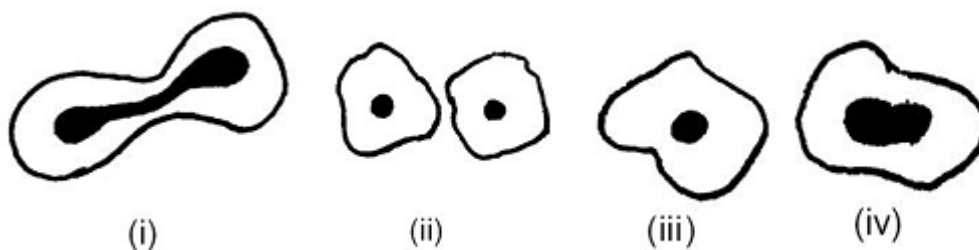


OR

Calculate the factor by which the potential difference across the fixed resistor must be reduced in order to reduce its electric power to  $1/4^{\text{th}}$  of the initial value.

26. Observe the steps in the process carefully.

(2)



- (a) Which method of reproduction is shown in the above figure? Identify the correct order of steps.
- (b) List two organisms which reproduce by the above method.

27. For performing an experiment, a student was asked to choose two convex lenses, one of focal length 20 cm and the other of focal length 30 cm, from a bunch of convex lenses of different focal lengths. How will he identify these lenses of required focal length? (2)