CBSE
Class X Science

Time: 3 hrs **Total Marks: 80**

General Instructions:

1. The question paper comprises of two **Sections, A** and **B**. You are to attempt both the sections.
2. All questions are compulsory.
3. All questions of **Section A** and **Section B** are to be attempted separately.
4. There is an internal choice in **three** questions of **three** marks each, **two** questions of **five** marks each in Section A and in **one** question of **two** marks in Section B.
5. Question numbers**1**and**2** in **Section A** are **one mark** questions. These are to be answered in one word or in **one** sentence.
6. Question numbers **3** to **5** in **Section A** are **two marks** questions. These are to be answered in about **30 words each**.
7. Question numbers **6** to **15** in **Section A** are **three marks** questions. These are to be answered in about **50 words each**.
8. Question numbers **16** to **21** in **Section A** are **five marks** questions. These are to be answered in about **70 words each**.
9. Question numbers **22** to **27** in **Section B** are based on practical skills. Each question is a **two** marks question. These are to be answered in brief.

Section A

1. Name two tissues which provide control and coordination in multicellular animals.(1)

2. Name the energy possessed by moving and stationary currents of water. (1)

3. How can you differentiate saturated and unsaturated hydrocarbons on the basis of burning behaviour? (2)

4. Will geographical isolation be a major factor in the speciation of an organism which reproduces asexually? Give reason for your answer. (2)

5. The refractive index of water is 1·33 and the speed of light in air is 3×10^8 ms^{-1}. Calculate the speed of light in water. (2)

6. (3)

(a) Draw a schematic labelled diagram of a domestic wiring circuit which includes

(i) A main fuse

(ii) A power meter

(iii) One light point

(iv) A power output socket

(b) On which wire in the circuit is the mains on/off switch connected?

7. What is translocation? Why is it essential for plants? Where in plants are the following synthesised: (i) Sugars, (ii) Hormones (3)

8. Differentiate between 'self-pollination' and 'cross pollination.' Describe 'double fertilisation' in plants. (3)

9. What happens when

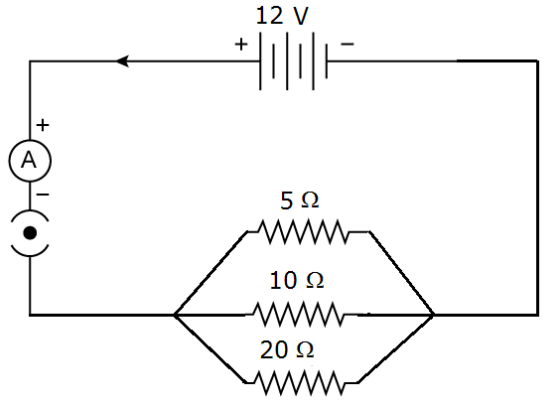
(a) Zinc reacts with copper sulphate?

(b) Magnesium reacts with HCl?

(c) Sodium reacts with water? (3)

10. Explain Mendel's experiment on inheritance of characters considering only one visible contrasting character in pea plant. (3)

11. In the circuit given below, three resistors of 5 Ω, 10 Ω and 20 Ω, respectively, are connected across a battery of 12 V. (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 200 V–100 W. What is the resistance of the appliance? Five such appliances run simultaneously for 4 hours. What is the energy consumed? Calculate the cost of running these appliances if the per unit cost is Rs 4.60.

12. What is ozone? How and where is it formed in the atmosphere? Explain how it affects an ecosystem.

OR

What is meant by biological magnification? With the help of a food chain, explain how biological magnification of harmful chemicals can occur. (3)

13. Corrosion is a serious problem. Every year an enormous amount of money is spent to replace damaged iron. What steps can be taken to prevent this damage? (3)

14. Answer the following: (3)

(a) What according to you happens to the eyes when you enter a darkened room from bright sunlight?

(b) Suggest how the iris helps protect the retina from damage by bright light.

(c) How do you compare the defect of a person wearing spectacles of +1.5 D to the one wearing spectacles of –1.5 D?

15. You are provided with three test tubes A, B and C which contain distilled water, acidic and basic solutions. If you are given blue litmus paper only, how will you identify the nature of the solutions in the three test tubes? (3)

OR

Write word equations and then balanced equations for the reaction taking place when -

(a) Dilute sulphuric acid reacts with zinc granules.

(b) Dilute hydrochloric acid reacts with Iron fillings.

(c) Dilute sulphuric acid reacts with aluminium powder.

16. (5)

(a) What are magnetic field lines? How is the direction of the magnetic field at a point determined?

(b) Draw two field lines around a bar magnet along its length on its two sides and mark the field directions on them by showing arrows.

(c) List any three properties of magnetic field lines.

17. A quiz contest was being held in the school for chemistry students. The quiz-master said:

An element has the electronic configuration 2, 8, 7.

(a) What is the atomic number of this element?

(b) Is it a metal, non-metal or metalloid?

(c) Which of the elements N, F, P and Ar shows similarity with this element?

(d) We use a compound of this element in our food. Identify that compound.

(e) A compound of this element causes hardness of water. Identify that compound.(5)

18. What is speciation? List four factors which could lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species? Explain.

OR

(a) Name the human male reproductive organ which produces sperms and secretes hormones. Write the functions of the hormone secreted.

(b) Name the parts of the human female reproductive system where
(i) fertilisation and (ii) implantation occur, respectively.
Explain how the embryo gets nutrition inside the mother's body.

(5)

19. An organic compound A is widely used as a preservative in pickles and has molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound B.

(a) Identify compound A.

(b) Write the chemical equation for its reaction with ethanol to form compound B.

(c) How can we get compound A back from B?

(d) Name the process.

(e) Which gas is produced when compound A reacts with washing soda? (5)

OR

(a) Why does micelle formation take place when soap is added to water? Will a micelle be formed in other solvents such as ethanol also?

(b) Explain the formation of scum when hard water is treated with soap.

20.

(a) Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

(b) Explain how lungs are designed in human beings to maximise the area for exchange of gases. Why does the air passage not collapse when there is no air in it? (5)

21. Name the type of mirrors used in (a) solar furnace and (b) rear-view mirror. Draw labelled diagrams to show the formation of 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 B

22. What happens if NaOH is added to ferrous ammonium sulphate solution and warmed? What is the inference?

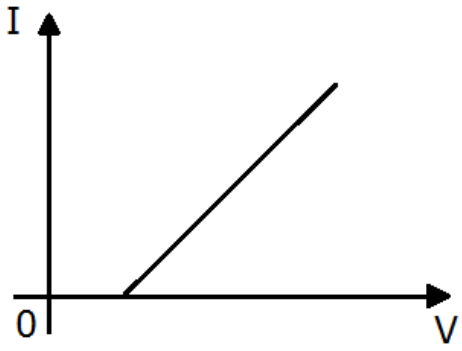
OR

What is observed when a solution of sodium sulphate is added to a solution of barium chloride taken in a test tube? Write equation for the chemical reaction involved and name the type of reaction in this case. (2)

23. What would a well-stained leaf peel preparation when focused under a high power of the microscope show? (2)

24. An iron knife kept dipped in a blue copper sulphate solution turns the blue solution light green. Why? (2)

25. The plot showing the dependence of the current (I) on the potential difference (V) across a resistor R is shown below. Identify the error and state the dependence mathematically. (2)



26. What is exosmosis? Where does it take place? (2)

27. For performing an experiment, a student was asked to choose one concave mirror and one convex lens from a bunch of mirrors and lenses of different kinds. How will he identify these optical devices? (2)