

**CBSE  
Class X Science  
Sample Paper - 4**

**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 5 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. Give an example of a flower which contains both stamens and carpels. (1)
2. Mention any one point of difference between pepsin and trypsin. (1)

**Section B**

3. Which energy is obtained from waste material of animals and dead parts of plants? State which type of energy it is. (2)
4. How are dams useful for society? Mention any two points. (2)

**OR**

List any two causes of our failure to sustain availability of underground water.

5. Comment on the statement: 'All ores are minerals but all minerals are not ores'. (2)

### Section C

6. In the electrolysis of water, [3]
- (a) Name the gas collected at the anode and the cathode.
  - (b) Why is the volume of the gas collected at one electrode double than that collected at the other?
  - (c) What would happen if dil.  $\text{H}_2\text{SO}_4$  is not added to water?
7. List three distinguishing features between sexual and asexual reproduction in the tabular form. (3)

**OR**

State in brief the function of the following parts of the human male reproductive system:

- (a) Scrotum
  - (b) Testes
  - (c) Vas deferens
8. (3)
- (a) Draw the structure of propanoic acid ( $\text{C}_2\text{H}_5\text{COOH}$ ).
  - (b) Why does the bottom of a cooking vessel blacken?
  - (c) What is a micelle? Draw a labelled diagram of a micelle.
9. How can a magnetic field be produced without using a magnet? Describe an experiment to show that a magnetic field exerts a force on a current-carrying conductor. (3)
10. (3)
- (a) Which phenomenon makes us see the Sun a few minutes before and after the actual sunrise and sunset?
  - (b) How many minutes before sunrise or after sunset can we actually see the Sun?
  - (c) By how many minutes is the day lengthened? What would have happened if there was no atmosphere around the Earth?
11. The image of an object placed at 30 cm in front of a lens is obtained on a screen at a distance of 60 cm from it. Find the focal length of the lens. What would be the height of the image if the object is 2 cm high? (3)

**OR**

Two thin lenses of power +2.5 D and -1.5 D are placed in contact. Find the power and focal length of the lens combination.

12. A brown substance 'X' on heating in air forms a compound 'Y'. When hydrogen gas is passed over 'Y', it changes to 'X' again. (3)
- Name substances 'X' and 'Y'.
  - Name the processes occurring during the two changes.
  - Write the chemical equations involved.

**OR**

Identify the following reactions:

- $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$
- $\text{CaO}(\text{s}) + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$
- $2\text{KCl}_3 \xrightarrow{\Delta} 2\text{KCl} + 3\text{O}_2$

13. What are chromosomes? Explain how the number of chromosomes in the progeny of sexually reproducing organisms is maintained. (3)
14. List four points of significance of reproductive health in society. Name any two areas related to reproductive health which have improved over the past 50 years in our country. (3)
15. A pea plant with blue flowers denoted by BB is cross-bred with a pea plant with white flowers denoted by ww. (3)
- What is the expected flower colour in the  $F_1$  progeny?
  - What will be the percentage of plants bearing white flowers in the  $F_2$  generation when the flowers of  $F_1$  plants are self-pollinated?  
State the expected ratio of the genotypes BB and Bw in the  $F_2$  progeny.

### Section D

- 16.
- How does control and coordination occur in plants? How does this function in plants differ from that in animals?
  - Name five stimuli which act on plants. Name the type of tropic movement produced by each of these stimuli.
  - Define hydrotropism with the help of an example. Explain hydrotropism with the help of a diagram. (5)

**OR**

How does hypothalamus control the production of hormones?

17. What is myopia? What are the causes of myopia?

One student uses a lens of focal length  $+50$  cm and another of  $-50$  cm. State the nature of each lens and find their powers. Which of the two lenses will always give a virtual, erect and diminished image irrespective of the position of the object? (5)

18. (5)

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

(b) How is plaster of Paris prepared from gypsum? For what purpose is it used in hospitals?

**OR**

(a) Write the chemical formula of washing soda and baking soda. Which of these two is an ingredient of antacids? How does an antacid provide relief from a stomachache?

(b) What is roasting and calcination? What is the difference between them?

19. (5)

(a) List the factors on which the resistance of a conductor depends.

(b) A 4-kW heater is connected to a 220-V power source. Calculate

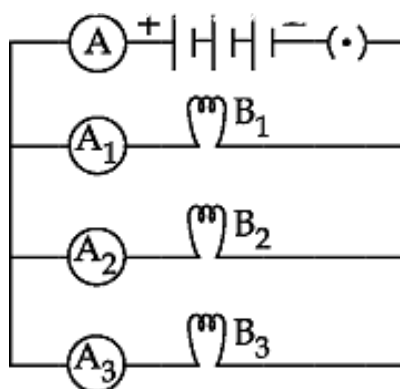
(i) Electric current passing through the heater.

(ii) Resistance of the heater.

(iii) Electric energy consumed in a 2-hour use of the heater.

**OR**

What is meant by the statement 'the potential difference between two points is 1V'? Study the circuit shown in which three identical bulbs B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> are connected in parallel with a battery of 4.5 V.



- (a) What will happen to the glow of the other two bulbs if the bulb B<sub>3</sub> gets fused?
- (b) If the wattage of each bulb is 1.5 W, what readings will the ammeter A show when all the three bulbs glow simultaneously?
- (c) Find the total resistance of the circuit.

20. What are fossils? How are they formed? Describe in brief two methods of determining the age of fossils. State any one role of fossils in the study of evolution. (5)

21. A part of the modern periodic table is given below. Answer the following questions based on this table. (5)

H							He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

- (a) Why do H, Li and Na show similar properties?
- (b) Mg atom is bigger than Be atom. Why?
- (c) Why are He, Ne and Ar called noble gases?
- (d) Write a common name of the family to which F and Cl belong.
- (e) Write the trend of non-metallic character in the horizontal row from Na to Cl.
- (f) How does the atomic size vary as we move from Li to F in the second period of the periodic table?

### Section E

22. A student is given a permanent slide showing binary fission in Amoeba. What are the steps for focussing the object under the microscope? (2)

23. Students were asked to observe permanent slides showing different stages of budding in yeast under high power of a microscope. (2)

- (a) Which adjustment screw (coarse/fine) would be moved to focus the slides?
- (b) Draw three diagrams in correct sequence showing budding in yeast.

**OR**

A student dissolved 1 g of sugar in 10 mL of distilled water in beaker A. He dissolved 10 g of sugar in 100 mL of distilled water in beaker B. Then he dropped a few raisins in each. What will happen to the raisins?

24. Why does the colour of copper sulphate solution change when an iron nail is kept immersed in it? (2)

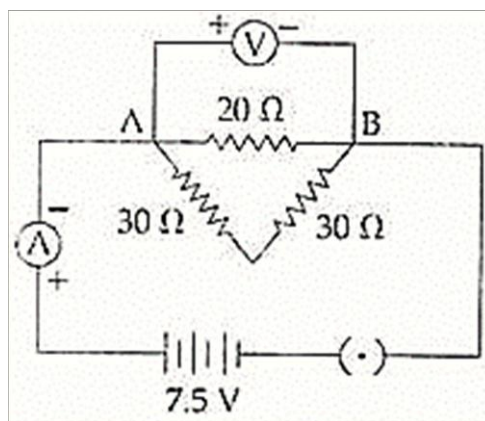
**OR**

What happens when a sheet of zinc is put in copper sulphate solution?

25. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain. (2)

26. An object of height 2.5 cm is placed at a distance of 15 cm from the optical centre 'O' of a convex lens of focal length 10 cm. Draw a ray diagram to find the position and size of the image formed. Mark optical 'O', principal focus F and height of the image on the diagram. (2)

27. A student joined three resistances as shown in the circuit below. Calculate the current recorded by the ammeter (A). (2)



OR

To find the equivalent resistance of two resistors  $R_1$  and  $R_2$  connected in series, Rahul prepared a circuit as shown below. His friend observed the circuit and said that the circuit is incorrect. What is the mistake noted by Rahul's friend?

