CBSE
Class X Science
Sample Paper 5

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

General Instructions:

1. The question paper comprises three sections – A, B and C. Attempt all the sections.
2. All questions are compulsory.
3. Internal choice is given in each section.
4. All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50–60 words each.
6. All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80–90 words each.
7. This question paper consists of a total of 30 questions.

Section A

1. What causes short circuiting? (1)

2. What is the scientific term for the cessation of the menstrual cycle in females? (1)

3. 'X' is an organic compound having the molecular formula $C_2H_4O_2$ and is used as a preservative in pickles. This compound reacts with ethanol to form a sweet-smelling compound 'Y'.

(a) Identify compound 'X'. (1)
(b) Write the chemical equation for the formation of compound 'Y' (1)
(c) How is compound 'X' formed from compound 'Y'? (1)
(d) Write the chemical equation and name the process. (1)

4.

Observe the table and answer the questions from 4(a) to 4(d).

Substance	Resistivity
A	$1.6 \times 10^{-8}\ \Omega$ m
B	$44 \times 10^{-8}\ \Omega$ m
C	$2.63 \times 10^{-8}\ \Omega$ m
D	$2300\ \Omega$ m
E	$10^{17}\ \Omega$ m

(a) Which of the above substances can be used as an insulator? (1)
(b) Which of the above substances can be used for the purpose of domestic wiring? (1)
(c) Which of the above substances is used for making solar cells and transistors? (1)
(d) Which of the above substances is an alloy? (1)

5. A man stands 10 m away in front of a large plane mirror. How far must he walk before he is 5 m away from his image? (1)

(i) 2.5 m
(ii) 4.5 m
(iii) 7.5 m
(iv) 5 m

OR

If an object is placed at infinity in front of a concave mirror, the image is formed at

(i) the focus
(ii) between the focus and the pole
(iii) between the focus and the centre of curvature
(iv) behind the mirror

6. The South Pole of the Earth's magnet is in the (1)

(i) geographical south
(ii) geographical north
(iii) geographical east
(iv) geographical west

7. Air flows into the lungs when there is (1)

i) a decrease in volume and an increase in pressure
ii) a decrease in volume and no change in pressure
iii) an increase in volume and a decrease in pressure
iv) an increase in pressure and no change in volume

8. DDT was accidentally added to the water of a lake. Which of the following organisms would be affected the most? (1)

i) Man
ii) Birds living near the lake
iii) Fish living in the lake
iv) Aquatic plants living in the lake

OR

What is the environmentally friendly way to dispose of used tyres?

i) Dump them in a ditch along the road
ii) Collect and burn them as trash
iii) Dispose them in a landfill
iv) Recycle them

9. Which of the following is common to both cell body and dendrite? (1)

i) Cyton
ii) Neurofibrils
iii) Nissl's granules
iv) All of these

10. Bleaching powder gives the smell of chlorine because it (1)

i) Produces chlorine on exposure to air
ii) Contains a mixture of slaked lime and chlorine
iii) Is unstable
iv) Contains excess of chlorine

11. Aluminium oxide reacts with sulphuric acid to form (1)

i) Aluminium sulphate and hydrogen
ii) Aluminium sulphate and water
iii) Aluminium sulphide and oxygen
iv) Aluminium sulphate and oxygen

12. Variations within a species are most likely the result of (1)

i) Synapsis and disjunction
ii) Overpopulation and recombination
iii) Mutations and sexual reproduction
iv) Mitosis and asexual reproduction

OR

Successfully grafted plants bear flowers and fruits characteristic of

i) Stock
ii) Scion
iii) Both stock and scion
iv) Either stock or scion

For question numbers 13 and 14, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below.

i) Both A and R are true, and R is the correct explanation of the assertion.
ii) Both A and R are true, but R is not the correct explanation of the assertion.
iii) A is true, but R is false.
iv) A is false, but R is true.

13. **Assertion**: Total coliform bacteria found in River Ganga are much more than the minimum desired level.

Reason: Largely untreated sewage such as garbage and excreta are dumped into the Ganga. (1)

14. **Assertion**: The major constituent of biogas is methane. (1)
Reason: Biogas contains up to 75% of methane gas.

Section B

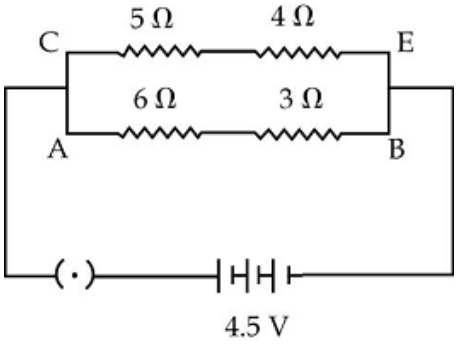
15. How are the alveoli designed to maximise the exchange of gases? [3]

16. Describe the concept of trophic levels. [3]

OR

Which part of the brain controls involuntary actions? Write the function of any of its two regions.

17. Study the circuit and find the [3]



(a) Total resistance in arm CE
(b) Current in arm AB
(c) Potential difference across the 4-ohm resistor

18. [3]

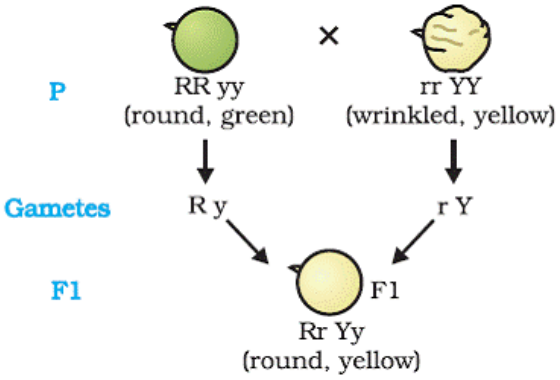
(a) Name two constituents of baking powder.
(b) How does baking powder differ from baking soda?
(c) Explain the action of baking powder in the making of cake (or bread). Write the equation of the reaction involved.

19. [3]

(a) How did the 'Chipko Andolan' ultimately benefit the local population?
(b) Why should we conserve wildlife?
(c) Expand the term IUCN.

20.

(a) How many characters are transmitted in the following cross? Name them. [3]
(b) Define dominant trait and recessive trait.



21. A substance 'X' is used in the kitchen for making tasty crispy pakoras and is also an ingredient of antacid. Name substance 'X'. [3]

(a) How does 'X' help to make cakes and bread soft and spongy.

(b) Is the pH value of a solution of 'X' lesser than or greater than 7.0?

OR

Acetic acid is a typical acid. Write the equation in each case for its reaction with a

(a) Metal

(b) Base/alkali

(c) Carbonate

22. How does the strength of the magnetic field at the centre of a circular coil of a wire depend on [3]

(a) Radius of the coil

(b) Number of turns of wire in the coil

(c) Draw the magnetic lines of force in case of a circular coil of a wire

OR

Mention the factors on which the direction of force experienced by a current-carrying conductor placed in a magnetic field depends.

(a) Under what condition is the force experienced by a current-carrying conductor placed in a magnetic field maximum?

(b) A proton beam is moving along the direction of a magnetic field. What force is acting on the proton beam?

23. Explain giving one example for each of the following chemical reactions:

(a) Double decomposition reaction

(b) Thermal decomposition reaction

(c) Displacement reaction

24. [3]

(a) For what position of the object does a convex lens form an erect and virtual image?

(b) What is regular reflection of light?

(c) What type of mirror is used as a shaving mirror? Support your answer with a reason.

Section C

25. [5]

(a) Name a metal which is placed low in the activity series and exists as a liquid at room temperature.
(b) Write the name and formula of its ore.
(c) How is the metal extracted from this ore?
(d) Write the chemical equation for the reaction involved.

OR

Hydrogen gas is evolved by reacting a piece of magnesium ribbon with water:

(a) Describe how you could show that the gas collected is hydrogen.
(b) Write a symbol equation for the reaction taking place between magnesium and water.
(c) Suggest how the appearance of magnesium would change after a week.
(d) A few drops of universal indicator solution were added to water in a beaker. What colour would you expect to see and what pH would this colour indicate?

26. [5]

(a) Draw a neat diagram of the respiratory system and label the following parts:
(i) Lungs, (ii) Trachea, (iii) Bronchus, (iv) Diaphragm
(b) Name the respiratory pigment in human beings and discuss its role.
(c) Why is the rate of breathing in aquatic organisms faster than that in terrestrial organisms?

OR

(a) What is regeneration of an organism? With a neat diagram, describe regeneration in Planaria.
(b) How does the embryo get nourishment inside the mother's body?
(c) List the changes seen in the ovule and ovary after fertilisation.

27. [5]

(a) How has the method of artificial selection by humans helped in the evolution of different vegetables? Explain in brief with the help of an example.
(b) Mention some of the tools for tracing evolutionary relationships among species.

28. [5]

(a) State the rule to determine the direction of a
    (i) Magnetic field produced around a straight conductor carrying current
    (ii) Force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it
    (iii) Current induced in a coil due to its rotation in a magnetic field
(b) Differentiate between AC and DC. Write one advantage of AC over DC.

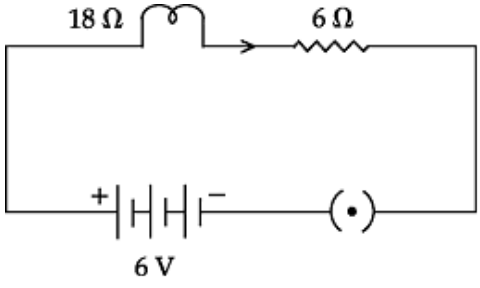
29. Which element has [5]

(a) Two shells, both of which are completely filled with electrons
(b) The electronic configuration 2, 8, 2
(c) A total of three shells with four electrons in the valence shell
(d) A total of two shells with three electrons in the valence shell
(e) Twice as many electrons in the second shell as in the first shell

30.

(a) What is electromagnetic induction?
(b) Describe the various methods of producing induced current.
(c) A coil of insulated copper wire is connected to a galvanometer. What will happen if a bar magnet is held stationary inside the coil?

OR



In the given circuit, calculate

(a) Total resistance of the circuit
(b) Current flowing through the circuit
(c) Potential difference across the lamp and the resistor