CBSE
Class X Science
Sample Paper 3

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 is the term used to define the ratio of potential difference and current? (1)

2. What is the main constituent of petroleum gas? (1)

3.

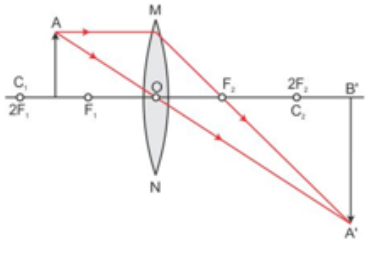
(a) Study the following cross showing self-pollination in F_1. Answer the questions that follow:

Parents	RRYY (Round, yellow) × rryy (Wrinkled, green)
F_1	RrYy (Round, yellow) × **?**

(i) What will come in place of '**?**' (1)

(ii) What are the different combinations of characters in the F_2 progeny? (1)

(b) Observe the diagram given below and answer the following questions:



(i) What will be the position and nature of the image if the object is moved and brought at F_1? (1)

(ii) If the lens forms an image of magnification –2 cm, then what is the nature of the image? (1)

4. Solutions A, B, C and D have pH 6, 14, 1 and 8, respectively. Using this information, answer the following questions:

(a) Identify the solutions that are basic in nature. (1)

(b) Identify the solutions that are acidic in nature. (1)

(c) Which solution contains molecules as well as ions? (1)

(d) Which solutions are highly acidic and highly alkaline? (1)

5. If the potential difference between the ends of a fixed resistor is doubled, the electric power will become (1)

(i) double

(ii) half

(iii) one-fourth

(iv) four times

OR

Which of the following is the commercial unit of energy?

(i) Watt

(ii) Electron volt

(iii) Kilowatt hour

(iv) Joule

6. What is the frequency of direct current? (1)

(i) 50 Hz

(ii) 50 kHz

(iii) 0 Hz

(iv) 100 Hz

7. A human being with his one eye open has a horizontal fieldview of about (1)

(i) 120°

(ii) 150°

(iii) 90°

(iv) 180°

8. Which famous movement was started by the women of Advani forest in Reni, Garhwal, against the felling of trees? (1)

(i) Chipko Movement

(ii) Appiko Movement

(iii) Bishnoi Movement

(iv) Bahuguna Movement

OR

Which of the following reduces global warming?
(i) Using air coolers and fans instead of ACs
(ii) Replacing light bulbs with CFLs
(iii) Using energy-efficient products
(iv) All of these

9. Which among the following is not a function of the testes at puberty? (1)
a) Formation of germ cells
b) Secretion of testosterone
c) Development of placenta
d) Secretion of oestrogen
(i) (a) and (b)
(ii) (b) and (c)
(iii) (c) and (d)
(iv) (a) and (d)

10. Copper, when exposed to moist air, forms a green coating on the surface. This green coating is of (1)
(i) Copper carbonate
(ii) Copper sulphate
(iii) Copper(I) oxide
(iv) Copper(II) oxide

11. The following reaction is an example of (1)
$2CO + O_2 \xrightarrow{\Delta} 2CO_2$
(i) Combination reaction
(ii) Decomposition reaction
(iii) Displacement reaction
(iv) Double displacement reaction

12. Phagocytosis involves (1)
(i) leucocytes and monocytes
(ii) eosinophils and basophils
(iii) neutrophils and monocytes
(iv) eosinophils and monocytes

OR

What is the breathing rate in human beings?
(i) 5–6 times/min
(ii) 15–18 times/min

(iii) 40–45 times/min
(iv) 60–70 times/min

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**: Arteries are thick walled and elastic in nature. (1)
Reason: Arteries have to transport blood away from the heart.

14. **Assertion**: When white light passes through a glass prism, red colour is deviated the least.
Reason: Red colour has the minimum speed in the glass prism. (1)

Section B

15. (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?

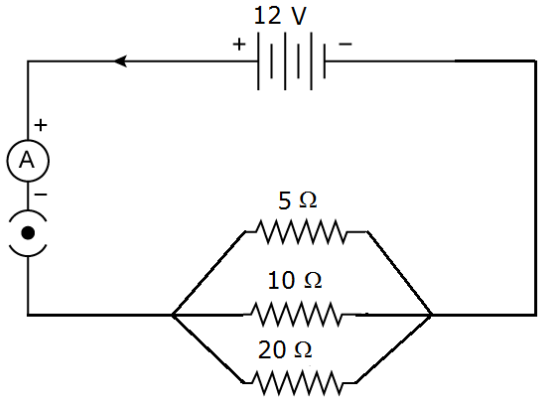
16. What is translocation? Why is it essential for plants? Where in plants are the following synthesised: (i) Sugars, (ii) Hormones (3)

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

18. Write one equation each for decomposition reactions where energy is supplied in the form of (a) heat, (b) light and (c) electricity. (3)

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

20. 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.

21. 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)

22. How can the rusting of iron be prevented? (3)

23. 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?

24. 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 the chemical equation for the preparation of

(a) Bleaching powder

(b) Plaster of Paris

(c) Caustic soda

Section C

25. (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.

OR

State and explain the principle of the working of a dynamo. State the transformation of energy which takes place in a dynamo. What is a dynamo also called?

Explain why the direction of induced current changes after every half revolution.

26. A Chemistry quiz contest was being held in the school for students. The quiz master said: (5)

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 show 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.

27. 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. (5)

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

Explain how the embryo gets nutrition inside the mother's body.

28. 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)

(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?

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.

29.

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

(b) Explain how the 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)

30. Name the type of mirrors used in (a) a solar furnace and (b) a rear-view mirror. Draw labelled diagrams to show the formation of an image in each of these 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)