

**CBSE
Class X Science
Sample Paper - 13**

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 maintains posture and equilibrium of the body? (1)
2. List two functions of the ovary of the human female reproductive system. (1)

Section B

3. Why do HCl, HNO₃ etc. show acidic characters in aqueous solutions, while solutions of compounds like alcohol and glucose do not show acidic character? (2)

OR

A boy dropped a bottle of hydrochloric acid on an egg shell and noticed bubbles of gas. Explain the chemical reaction involved.

4. A pregnant woman happened to tumble down accidentally. But it did not affect the foetus at all. Why? (2)
5. If the radius of curvature of a spherical mirror is 30 cm. What is its focal length? (2)

Section C

6. State Maxwell's right-hand thumb rule. (3)
7. A few tapioca plants remained in the farmland after harvest. Harvesting was done in summer. Then there was a summer rain. When these plants were harvested and the tubers eaten raw, they tasted sweet. Can you explain the reason for the sweet taste of the tubers? (3)
8. Explain that it is a matter of chance whether a couple will give birth to a boy or a girl. (3)
9. An element reacts with oxygen to form an oxide which dissolves in dilute hydrochloric acid. The oxide formed also turns a solution of red litmus blue. Is the element a metal or non-metal? Explain with the help of a suitable example. (3)
10. The genotype of green-stemmed tomato plants is denoted as GG and that of purple-stemmed tomato plants as gg. When these two are crossed,
(i) What colour of stem would you expect in their F_1 progeny?
(ii) Give the percentage of purple-stemmed plants if F_1 plants are self-pollinated.
(iii) In what ratio would you find the genotypes GG and Gg in the F_2 progeny? (3)
11. Three resistors of 10Ω , 30Ω and 50Ω , 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 bulb is rated 220V–100 W. What is the resistance of the bulb? Three such bulbs run simultaneously for 4 hours. What is the energy consumed? Calculate the cost of running these appliances if the per unit cost is Rs2.80.

12. What is a dam? Why do we seek to build large dams? While building large dams, which three main problems should particularly be addressed to maintain peace among local people? Mention them.

OR

Differentiate between biodegradable and non-biodegradable substances with the help of one example each. List two changes in habit that people must adopt to dispose non-biodegradable waste for saving the environment. (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) A concave mirror produces three times larger real image of an object placed at a distance of 20 cm in front of it. Find the position of the image and the nature of the image. Also, find the focal length of the mirror.

15. A student has mixed solutions of lead (II) nitrate and potassium iodide.

- What was the colour of the precipitate formed? Can you name the compound precipitated?
- Write the balanced chemical equation for this reaction.
- What type of reaction is it? (3)

OR

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

Section D

16. (5)

- List the three properties of magnetic field lines.
- Define electromagnet. State the principle on which the working of magnet is based.
- What are the factors affecting the strength of an electromagnet.

17. The following table shows the position of six elements A, B, C, D, E and F in the periodic table. (5)

| Periods Groups | 1 | 2 | 3 to 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|-------------------|---|---|------------|----|----|----|----|----|----|
| 2. | A | | | | | B | | | C |
| 3. | | D | | | E | | | | F |

Using the above table, answer the following questions:

- Which element will form only covalent compounds?
 - Which element is a metal with valency 2?
 - Which element is a non-metal with valency 3?
 - Out of D and E, which one has a bigger atomic radius and why?
 - Write the common name for the family of elements C and F.
18. Define evolution. How does it occur? Describe how fossils provide us evidences in support of evolution.

OR

Define the terms pollination and fertilisation. Draw a diagram of a pistil showing pollen tube growth into the ovule and label the following: pollen grain, male gamete, female gamete and ovary.

- 19.** An organic compound A having the molecular formula C_3H_8O is a liquid at room temperature. The organic liquid A reacts with sodium metal to evolve a gas which burns causing a little explosion. When the organic liquid A is heated with concentrated sulphuric acid at $170^\circ C$, it forms a compound B which decolourises bromine water. The compound B adds one molecule of hydrogen in the presence of Ni as catalyst to form compound C which gives substitution reactions with chlorine.
- What is compound A?
 - What is compound B?
 - What type of reaction occurs when A is converted to B?
 - What is compound C?
 - What type of reaction takes place when B is converted to C?

OR

A water-insoluble substance 'X' on reacting with dilute H_2SO_4 released a colourless and odourless gas accompanied by brisk effervescence. When the gas was passed through water, the solution obtained turned blue litmus red. On bubbling the gas through lime water, it initially became milky and the milky appearance disappeared when the gas was passed in excess.

Identify the substance 'X' and write the chemical equation of the reactions involved.

- 20.**
- What does HIV stand for? Is AIDS an infectious disease? List any four modes of spreading AIDS.
 - Explain how the lungs are designed in human beings to maximise the area for the exchange of gases. Why does the air passage not collapse when there is no air in it? (5)

21. Draw the ray diagram and state the nature and position of the image formed:

- When the object is at $2F$ in front of a convex lens
- When the object is placed anywhere between the optical centre and infinity of the concave lens

OR

- What is the mirror formula? Give an expression for the mirror formula.
- Define the following terms related to spherical mirrors:
 - Pole
 - Centre of curvature
 - Principal axis

Section E

22. What is observed when ethanoic acid was added to sodium bicarbonate solution and the gas evolved was tested with a burning splinter?

OR

What is observed when a solution of sodium sulphate is added to a solution of barium chloride taken in a test tube? Write the 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)

OR

A student is observing a permanent slide showing sequentially the different stages of asexual reproduction taking place in yeast. Name this process and draw diagrams of what he observes in a proper sequence.

24. People use a variety of methods to wash clothes. Usually after adding the soap, they 'beat' the clothes on a stone, or beat it with a paddle, scrub with a brush or the mixture is agitated in a washing machine. Why is agitation necessary to get clean clothes? (2)

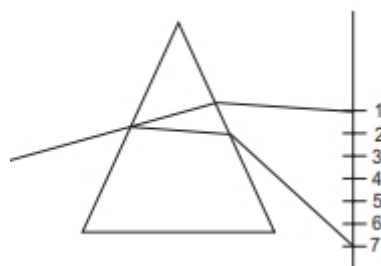
25. In a circuit, bulb B1 has a resistance of 20 ohms and B2 has a resistance of 10 ohms. Which bulb will glow brighter and which will glow dimmer. Explain. (2)

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

27. Ridhima is sitting on the last bench. She is unable to see the blackboard properly but can read from her book clearly. Which defect of vision is she suffering from? How can this defect of vision be corrected? (2)

OR

A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram.



Which two positions correspond closely to the colour of

- (i) a solution of potassium permanganate
- (ii) danger or stop signal lights