CBSE
Class X Science
Sample Paper 7

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. 'Dry HCl gas does not change the colour of dry blue litmus paper'. Give reason. (1)

2. Why is carbon not used for reducing aluminium from aluminium oxide? (1)

3. A man while driving a car complains that he has a difficulty in driving because he cannot see distant traffic clearly but can only see nearby vehicles. He goes for an eye checkup, and the eye specialist prescribes the name and power of lenses to be worn as spectacles. The focal length of these lenses is 80 cm.

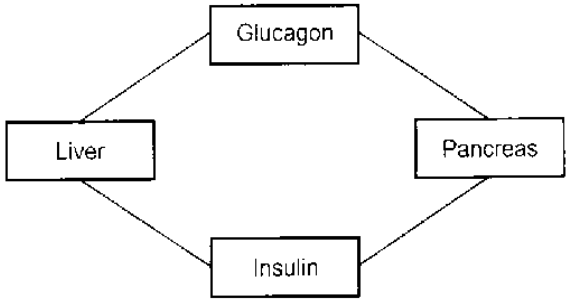
(a) Name the defect the man is suffering from. (1)

(b) Give two causes of this defect. (1)

(c) What is the nature of the lens recommended to the person for correcting his vision? (1)

(d) What is the power of lens given for the correction of vision? (1)

4. Study the diagram given below and answer the following questions:



(a) Name the pancreatic cells which produce (1) glucagon and (2) insulin. (1)
(b) State the main function of (1) glucagon and (2) insulin. (1)
(c) Why is the pancreas referred to as an exo-endocrine gland? (1)
(d) Why is insulin not given orally but is injected into the body? (1)

5. Which of the following is not a suitable characteristic of wire used in making an electric fuse?
i) Thin and short
ii) Low melting point
iii) Higher resistance
iv) Thick and short (1)

OR

If a charge of 420 C is flowing from the wire for 5 minutes, then the value of current is
i) 84 mA
ii) 2 A
iii) 1.4 A
iv) 5 A

6. The magnetic field inside a long straight solenoid carrying current is
i) uneven
ii) zero
iii) same at all points
iv) None of these (1)

7. Which of the following is not ultimately derived from the Sun?
i) Wind energy
ii) Fossil fuel
iii) Biomass
iv) Geothermal energy (1)

8. What will happen if deer is missing in the food chain given below? (1)
Grass $\rightarrow$ Deer $\rightarrow$ Tiger
i) The population of tiger increases.

ii) The population of grass increases.
iii) The tiger population will start eating grass.
iv) The population of tiger decreases, and the population of grass increases.

OR

Which agency looks after the steps to reduce ozone depletion?

i) UNEP
ii) UNESCO
iii) UNO
iv) WHO

9. A man with blood group A marries a woman with blood group O. The blood group of the child would be (1)

i) A
ii) AB
iii) O
iv) It is difficult to decide the blood group of the child.

10. Which is the correct chemical equation for the reduction of copper? (1)

i) $2Cu_2O + Cu_2S \xrightarrow{Heat} 6Cu + SO_2$
ii) $2Cu_2O \xrightarrow{Heat} Cu + O_2$
iii) $Cu_2O \longrightarrow Cu + O_2$
iv) $2Cu_2S + 3O_2 \xrightarrow{Heat} 2Cu_2O + 2SO_2$

11. Among the alkaline earth metals, which element has high metallic character? (1)

i) Be
ii) Mg
iii) Ca
iv) Sr

12. Propanone is a three-carbon compound with the functional group of (1)

i) Ester
ii) Ketone
iii) Alcohol
iv) Aldehyde

OR

The IUPAC name of the product is $C_2H_5COOH + CH_3OH \xrightarrow{H_2SO_4} C_2H_5COOCH_3$

i) Dimethyl ester
ii) Methyl ethanoate
iii) Ethyl methanoate
iv) 1-Methyl ethanoate

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**: Carbon is not used for reducing aluminium from aluminium oxide.
Reason: Aluminium has greater affinity for oxygen than for carbon. (1)

14. **Assertion**: A convex lens has a virtual focus.
Reason: All light rays pass through the focus of a convex lens. (1)

Section B

15. A water-insoluble calcium compound A on reacting with dil. H_2SO_4 released a colourless and odourless gas B with brisk effervescence. When gas B was passed through lime water, the lime water turned milky and again formed compound A. Identify A and B, and write the chemical equations for the reactions involved. (3)

16. Give reasons for the following: (3)

(a) Diffusion is insufficient to meet the oxygen requirements of multicellular organisms.

(b) People living in the mountains have more red corpuscles in their blood than people living in the plains.

(c) Energy requirement is less for amphibians than for birds.

17. An element X belongs to Group 17 and the third period of the periodic table. (3)

(a) Write the electronic configuration of the element. What is its valency?

(b) Predict its nature, whether it is a metal or a non-metal.

(c) Give the formula of the compound formed when it combines with an element Y having a valency three.

18. Why does a current-carrying solenoid, when suspended freely, rest along a particular direction? Explain. (3)

OR

Is it possible that a magnetic field be produced without using a magnet? Show that a magnetic field exerts a force on a current-carrying conductor with a suitable experiment.

19. Name and define the phenomenon due to which we observe a rainbow. Explain with a diagram and name the colour of light which bends (i) the most and (ii) the least while passing through a glass prism. (3)

20. An object is placed between infinity and the pole of a convex mirror. Draw a ray diagram and also state the position, the relative size and the nature of the image formed. (3)

21. An organic compound A is a constituent of antifreeze and has the molecular formula C_2H_6O. Upon reaction with alkaline $KMnO_4$, compound A is oxidised to another compound B with formula $C_2H_6O_2$. Identify compounds A and B. Write the chemical equation for the reaction which leads to the formation of B.

OR

(a) Soaps are not effective for washing woollen garments. Why?
(b) Detergents are called 'soap-less soaps'. Why?
(c) Why is common salt added in the soap-making process?

22. Rahul complained of acidity on reaching home after a marriage. Explain the reason for acidity. (3)

OR

Most of the CO_2 produced in a tissue enters the red blood cells by diffusion. What happens to this CO_2?

23. If we cross a pure-bred tall (dominant) pea plant with a pure-bred dwarf (recessive) pea plant, we will obtain pea plants of the F_1 generation. If we now self-cross the pea plants of the F_1 generation, then we obtain pea plants of the F_2 generation. (3)
(a) What would the plants of the F_1 generation look like?
(b) State the ratio of tall plants to dwarf plants in the F_2 generation.
(c) State the type of plants not found in the F_1 generation but which appeared in the F_2 generation, mentioning the reason for the same.

24. State in brief the function of the following organs in the human female reproductive system: (3)
(a) Ovary
(b) Fallopian tube
(c) Uterus

Section C

25. (5)

(a) Draw a diagram of the excretory unit of the human kidneys and label the following parts:

Bowman's capsule, glomerulus, collecting duct, renal artery

(b) Write the important function of the structural and functional unit of the kidneys.

(c) Write any one function of an artificial kidney.

26. Which physical quantity indicates the degree of convergence or divergence of light rays passing through a lens?

One student uses a lens of focal length +75 cm and another of −75 cm. Find the nature of each lens and find their powers. State which of the two lenses will always give a virtual, erect and diminished image irrespective of the position of the object.(5)

27.

(a) What are amphoteric oxides? Give two examples. (5)

(b) Metals such as sodium and potassium are kept immersed in kerosene. Why?

(c) Give the balanced chemical equation for the reaction between aluminium and steam.

(d) Name a non-metal which is

(i) Liquid at room temperature

(ii) Lustrous

OR

(a) Name one metal each which is extracted by

(i) reduction with carbon

(ii) electrolytic reduction

(iii) reduction with aluminium

(iv) reduction with heat alone

(b) Give reason for the following:

Carbonate and sulphide ores are usually converted to oxides during the process of extraction of metals.

28. [5]

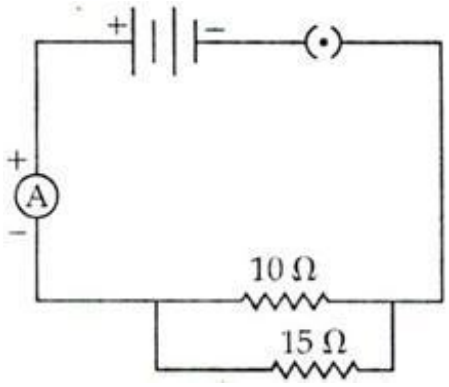
(a)What is an electric circuit?

(b)Calculate the number of electrons that flow per second to constitute a current of one ampere. Charge on an electron is 1.6×10^{-19}C.

(c) Draw an electric circuit for studying Ohm's law. Label the circuit component used to measure electric current and potential difference.

OR

Study the following circuit and answer the questions that follow.



(a) State the type of combination of the two resistors in the circuit.
(b) How much current is flowing through the
  i. 10-ohm resistor
  ii. 15-ohm resistor
(c) What is the ammeter reading?
(d) Define the SI unit of current.

29. (5)

(a) Why should we conserve our forests? List any two causes of deforestation.
(b) Prejudice against the traditional use of forest areas has no basis. Comment.

OR

(a) What is watershed management? How is it helpful to an ecosystem?
(b) Give any three advantages of groundwater.

30. Five solutions A, B, C, D and E when tested with universal indicator showed pH as 4, 1, 11, 7 and 9, respectively. Which solution is (5)

(a) Neutral
(b) Strongly alkaline
(c) Strongly acidic
(d) Weakly acidic
(e) Weakly alkaline