CBSE
Class X Science
Sample Paper 8

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

General Instructions:

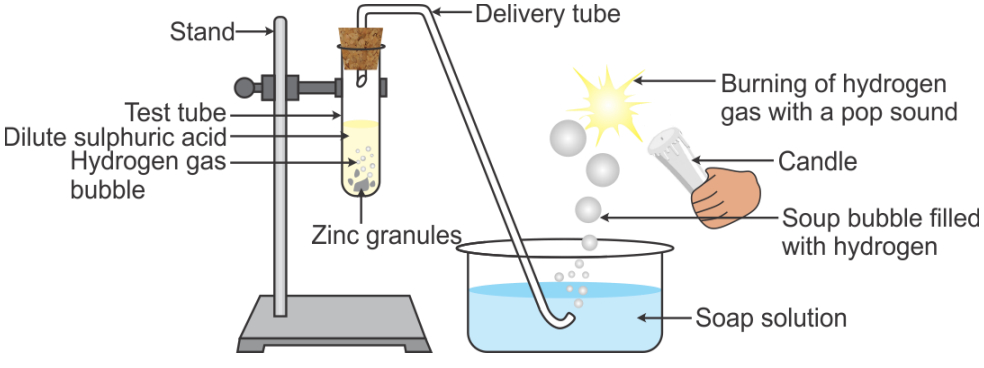
1. The question paper comprises three sections – A, B and C. Attempt all the sections.
2. All questions are compulsory.
3. Internal choice is given in each section.
4. All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered 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 are conventional sources of energy? (1)

2. Which intestinal juice completes the process of digestion in human beings? (1)

3. The preparation of hydrogen gas from zinc granules is shown in the following schematic diagram.



What will happen if

(a) Zinc dust is used instead of zinc granules? (1)

(b) Nitric acid is used Instead of sulphuric acid? (1)

(c) Copper turnings are used in place of zinc? (1)

(d) Sodium hydroxide is used in place of dilute sulphuric acid and heat is provided? (1)

4. Observe the given table in which the values of current flowing through a conductor for corresponding values of potential difference across the conductor.

Current (A)	Potential difference (V)
0.1	2.5
0.2	5.0
0.4	10.0
0.8	20.0
1.0	25.0

(a) Plot a graph between current and voltage. (1)
(b) Calculate the resistance of the conductor. (1)
(c) What is the nature of the graph? (1)
(d) What will be the value of current when potential difference is 15 V? (1)

5. A concave mirror is used as a
a) shaving mirror
b) head mirror
c) rear-view mirror
d) shop security mirror

i) a) and b)
ii) b) and c)
iii) c) and d)
iv) a), b), c) and d)

(1)

OR

A convex lens can produce an image of magnification
a) less than 1
b) more than 1
c) equal to 1

i) a) and b)
ii) b) and c)
iii) a) and c)
iv) a), b) and c)

6. The SI unit of resistivity is
i) Ω
ii) Ω/m
iii) Ωm
iv) Ωm^2

(1)

7. Which of the following defines the path of oxygenated blood in the heart? (1)

i) Left ventricle → Superior vena cava → Aorta → Right atrium
ii) Right atrium → Superior vena cava → Left ventricle → Aorta
iii) Left ventricle → Aorta → Superior vena cava → Right atrium
iv) Right atrium → Aorta → Superior vena cava → Left ventricle

8. If the secretions of the pituitary gland are under the control of _____, then this gland is supposed to be the super master gland. (1)

i) Hypothalamus
ii) Thyroid
iii) Pancreas
iv) Adrenal

OR

Which chain of events can lead to the development of goitre?

i) Less iodine → less thyroxine → goitre
ii) More iodine → more thyroxine → goitre
iii) Less iodine → more thyroxine → goitre
iv) More iodine → less thyroxine → goitre

9. Beetles of one sub-population are dropped by a crow into beetles of another sub-population. In this situation, a new species will not be formed because of (1)

i) Inheritance
ii) Gene flow
iii) Genetic drift
iv) Geographical isolation

10. The IUPAC name of isomer C_4H_{10} which has a branched chain is (1)

i) 2-Methyl butane
ii) 2-Methyl propane
iii) 1-Methyl butane
iv) 1-Methyl propane

11. Solder alloy is an alloy of (1)

i) Lead and tin
ii) Copper and tin
iii) Lead and copper
iv) Iron and tin

12. Which of the following helps in the conservation of wildlife? (1)

i) Building zoos
ii) Breeding animals in captivity
iii) Establishment of national parks
iv) All of these

OR

A food web is more realistic than a food chain for showing the feeding relationships in ecosystems because

i) It compares the number of consumers to the number of microorganisms in an ecosystem.
ii) Food chains use only a small sampling of organisms.
iii) A food web explains why there are more producers than consumers.
iv) Producers are usually eaten by many different consumers, and most consumers are eaten by more than one predator.

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: The ozone layer in the atmosphere is getting depleted allowing more UV rays to reach the Earth.
Reason: CFCs are broken down by UV radiation resulting in an attack on the ozone molecules damaging the ozone umbrella of the Earth. (1)

14. Assertion: The compass placed near the current-carrying wire remains stationary.
Reason: The current flowing through a wire always gives rise to a magnetic field. (1)

Section B

15. Explain with the help of an example how body characteristics are used to determine closeness of species in terms of evolution. (3)

OR

(a) Differentiate between autotrophs and heterotrophs.
(b) Who constitutes the first trophic level in a food chain?

16. An erect image of an object is to be formed using a concave mirror of 15 cm focal length. Find the range of distance of the object from the mirror. Draw a ray diagram and state the nature and size of the image for the observer. (3)

OR

A 2 cm high object is placed at a distance of 20 cm from a concave mirror. A real image is formed at 40 cm from the mirror. Calculate the focal length of the mirror. Also, find the height of the image formed.

17. Given below are some elements of the modern periodic table:

$_4$Be, $_9$Fe, $_{14}$Si, $_{19}$K, $_{20}$Ca

(a) Select the element which has one electron in the outermost shell and write its electronic configuration.

(b) Select two elements which belong to the same group. Give reasons for your answer.

(c) Select two elements which belong to the same period. Which one of the two has bigger atomic size?

18.

(a) Define power.

(b) What is the SI unit of power?

(c) What is the commercial unit of electrical energy?

19. (3)

(a) If a purple-flowered pea plant (PP) is crossed with a white-flowered pea plant (pp), will we have white-flowered pea plants in the F_1 generation? Explain.

(b) What do you mean by dominant and recessive traits?

20. (3)

(a) How does *Archaeopteryx* serve as a connecting link between birds and reptiles?

(b) What do you mean by the term evolution?

21. A solution of substance 'X' is used for whitewashing.

(i) Name substance 'X' and write its formula.

(ii) Write the reaction of substance 'X' with water.

(iii) Write the balanced equation for the following chemical reaction:

Barium chloride + Aluminium sulphate →Barium sulphate + Aluminium chloride

OR

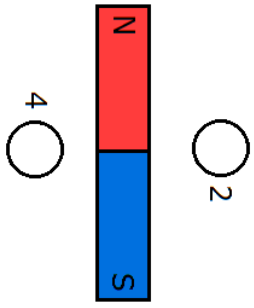
When a sodium compound 'X' which is also used in a soda-acid fire extinguisher is heated, it gives a sodium compound 'Y' along with water and carbon dioxide. 'Y' on crystallisation forms a compound 'Z'.

(a) Identify 'X', 'Y' and 'Z'.

(b) How can we obtain 'Y' from 'Z'?

(c) Write two uses of compound 'Z'.

22. The diagram below shows a bar magnet surrounded by two compasses numbered 2 and 4. What directions will these compasses show? (3)



23. Give the name and formula of an ore of zinc and reactions involved in the following steps:

(a) Roasting of the ore

(b) Reduction of the zinc compound which is the product of the above reaction.

(c) State one large scale use of zinc. (3)

24. Write balanced equations and identify the type of reaction involved for the following:

(a) Aluminium + Bromine → Aluminium bromide

(b) Calcium carbonate → Calcium oxide + Carbon dioxide

(c) Silver chloride → Silver + Chlorine

Section C

25. In order to study the properties of the acid HCl, a student added dilute HCl to a test tube containing a compound X. As a result, a colourless and odourless gas evolved; it also turned lime water milky. What could be compound X? Name the gas formed. What would happen on passing the gas in excess of lime water? (5)

26. (5)

(a) Write the three main steps which take place in chloroplasts during photosynthesis.

(b) How does stomata open and close?

(c) Which raw material is made available to the plants for photosynthesis when the stomata are open?

27. Draw a ray diagram for the following positions of the object placed in front of a convex lens: (5)

(a) Between the pole of the mirror and F

(b) Between F and 2F

(c) At 2F

(d) What will be the nature of the image for the convex and concave lenses for cases (i) and (ii)?

28. (5)

(a) Define and derive Joule's law of heating.

(b) Compare the heat produced when two identical resistors of resistance 'R' with a potential difference of 'V' for time 't' are connected in a

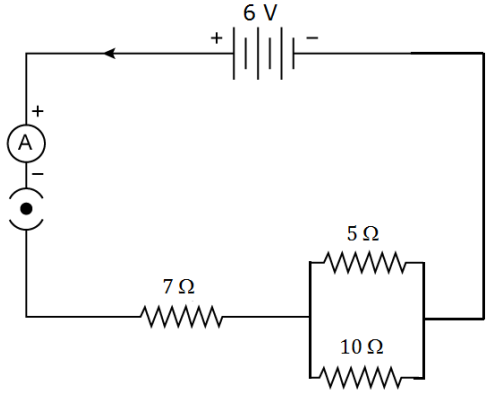
(i) Series combination

(ii) Parallel combination

OR

(a) Derive the expression for equivalent resistance if three resistors R_1, R_2 and R_3 are connected in a parallel combination.

(b) From the following electric circuit:



Calculate:

(i) Resultant resistance and current

(ii) Heat energy evolved when the circuit is switched on for 30 minutes

29. (5)

(a) Write two points of difference in the structures of diamond and graphite.

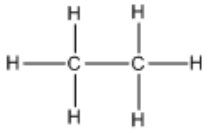
(b) Explain why graphite can be used as a lubricant but diamond cannot.

(c) State the two properties of carbon which led to the huge number of carbon compounds.

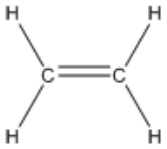
(d) Both carbon and silicon belong to Group 14 of the periodic table.
But the tendency to exhibit catenation in carbon is much more than silicon.Explain.

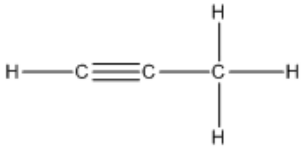
OR

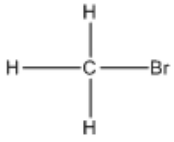
A to F are the structural formulae of some organic compounds:

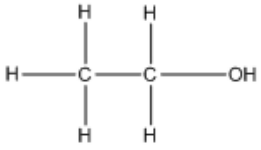

'A'


'B'


'C'


'D'


'E'


'F'

(a) Which of these compounds represent the same family?
(b) Which of these do not represent any hydrocarbon?
(c) How can compound 'C' be converted to compound 'A'?

30. (5)

(a) List any two advantages of vegetative propagation.
(b) Diagrammatically explain the process of reproduction in *Amoeba*.
(c) Where does fertilisation occur in the female reproductive tract?

OR

(a) What happens if an egg is not fertilised?
(b) Why do we need to adopt contraceptive measures?
(c) Name one bacterial and one viral sexually transmitted disease.
(d) How does the embryo get nourishment inside the mother's body?