CBSE

Class X Science

Sample Paper - 12

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. Calculate the current in the circuit if 40 C of charge is passed through a point in 10 sec. (1)

2. Name the material used to make the control rods in the reactor. (1)

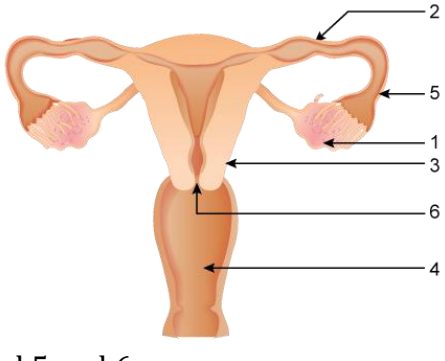
3.

(a) An electric heater connected to the 240 V main supply draws a current of 10 A. Find:

(i) Power of the heater (1)

(ii) Energy consumed in 2 minutes (1)

(b) The diagram given below represents a system in the human body. Study the diagram and answer the following questions:



(i) Label the parts marked 5 and 6. (1)

(ii) Name the two hormones secreted by 1. (1)

4. In the following table are given eight elements A, B, C, D, E, F, G and H of the modern periodic table with the atomic numbers of the elements in brackets. (4)

Period	Group 1	Group 2
2	A (3)	E (4)
3	B (11)	F (12)
4	C (19)	G (20)
5	D (37)	H (38)

(a) What is the number of valence electrons in C?
(b) Arrange the size of atoms of E, F, G and H in the decreasing order.
(c) State whether H is a metal or a non-metal.
(d) Out of the three elements B, E and F, which one has the largest atomic size?

5. When a 6-Ω resistor is connected across the terminals of an 18-V battery, the coulomb passing through the resistor per second is (1)
(a) 4
(b) 6
(c) 3
(d) 8

OR

Out of the following, identify the substance having very high electrical resistance:
(a) Superconductors
(b) Resistors
(c) Conductors
(d) Insulators

6. The principle of the DC generator is based on (1)
(a) Magnetic effect of current
(b) Electromagnetic induction
(c) Heating effect of current
(d) Electrochemical induction

7. In a concave mirror, reflection of light takes place at (1)
(a) Bulged out surface
(b) Flat surface
(c) Bent in surface
(d) Rough surface

8. According to Darwin, the species of life have originated from a common ancestor through the process of (1)
(a) Natural selection
(b) Inheritance
(c) Convergent evolution
(d) Microevolution

OR

The tuber of potato and the runner of lawn grass are homologous organs because both of them represent

(a) Roots
(b) Tubers
(c) Stems
(d) Tendrils

9. A rapid and temporary plant movement in response to the stimulus of touch is known as (1)

(a) Seismonastic movement
(b) Geotropic movement
(c) Hydrotropic movement
(d) Chemotropic movement

10. What do you see when vanilla extract is added to a base? (1)

(a) Change in colour
(b) Change in smell
(c) Change in taste
(d) Change in state

11. What are the by-products formed in the chlor-alkali process? (1)

(a) Hydrogen and oxygen
(b) Sodium and oxygen
(c) Hydrogen and chlorine
(d) Sodium and chlorine

12. The toxic chemical which accumulates in humans through the food chain is (1)

(a) CFC
(b) DDT
(c) Acetic acid
(d) Auxin

OR

The major gas responsible for the greenhouse effect is

(a) Water vapour
(b) Carbon dioxide
(c) Methane
(d) Ozone

13. Assertion: A drunk person walks clumsily.
Reason: All involuntary actions are controlled by the medulla in the brain. (1)

14. Assertion: The bending of a stick appears to take place by different amounts in different liquids.
Reason: Light is refracted in different media by different amounts. (1)

Section B

15. What is a reflex action? Describe the steps involved in a reflex action. (3)

16. How can it be said that birds are closely related to reptiles? (3)

OR

Distinguish between biodegradable and non-biodegradable substances. List two effects of each of them on our environment.

17. The face of a person is 24 cm long and 20 cm wide. What is the minimum size of the mirror required to see the full face? (3)

OR

An object 1 cm high produces a real image 1.5 cm high when placed at a distance of 15 cm from a concave mirror. Calculate the position of the image. (3)

18.

1 2 3 4 5 6 7

Na																	Cl	Ar

The positions of three elements in the periodic table are shown:

i. Write the atomic numbers of the elements.
ii. Give the electronic distribution of the elements.
iii. Using these three elements as examples, describe the trend in chemical properties across the third period of the periodic table.

19. Explain the term analogous organs with the help of an example. (3)

20. Describe briefly three ways in which individuals with a particular trait may increase in a population. (3)

21. In one of the industrial processes used for the manufacture of sodium hydroxide, a gas 'X' is formed as a by-product. Gas 'X' reacts with lime water to give a compound 'Y' which is used as a bleaching agent in the chemical industry. Identify 'X' and 'Y' giving the chemical equation of the reaction. (3)

OR

State which of the following chemical reactions will take place or not, giving suitable reason for each.

$Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$

$Fe_{(s)} + ZnSO_{4(aq)} \rightarrow FeSO_{4(aq)} + Zn_{(s)}$

$Zn_{(s)} + FeSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Fe_{(s)}$

22. What is an electromagnet? How is it different from a permanent magnet? State two uses of an electromagnet. (3)

23. (a) What is meant by an addition reaction? Give an example (with equation) of an addition reaction of an alkene.
(b) What is added to groundnut oil when it is to be converted to *vanaspati* ghee?
(c) Which of the two is better for our health—butter or vegetable oil? Why? (3)

24. An electric heater of resistance 10 Ω and resistance wire of 8 Ω are connected in series with a 6-V battery. Find (3)
i) Current through the circuit
ii) Potential difference across the electric heater
iii) Potential difference across electric wire

Section C

25.

(a) A student was given Mg, Zn, Fe and Cu metals. He put each of them in dil. HCl contained in different test tubes. Identify which of them
(i) will not displace H_2 from dil. HCl
(ii) forms a pale green substance
(iii) will give H_2 with 5% HNO_3
(iv) will be displaced from its salt solution by all other metals
(b) List any two observations when a highly reactive metal is dropped in water. (5)

26. What is the advantage of having a four-chambered heart? Support your answer with a diagram of the section of the human heart. (5)

OR

(a) Explain transport of food and other substances in plants.
(b) Diffusion will not be sufficient to provide raw materials in leaves and energy in roots in plants; therefore, a proper system of transpiration is essential. Explain.

27. (5)

(a) What do you mean by linear magnification produced by mirrors?
(b) The power of a lens is +1.5 D. What kind of lens is it and what is its focal length?
(c) Draw a ray diagram of an image when an object is placed on the principal axis of a convex lens between the focus and the optical centre.

28. (5)

(a) Derive an expression for Joule's law of heating.

(b) Compare the heat energy produced in the two cases: resistors are connected in a series combination and identical circuit elements are connected in a parallel combination.

OR

Deduce the expression for the equivalent resistance of the parallel combination of three resistors R_1, R_2 and R_3.

29. (5)

(a) What is a homologous series? Explain with an example.

(b) State two characteristics of a homologous series.

(c) The molecular formula of an organic compound is $C_{18}H_{36}$. Name its homologous series.

(d) Select the hydrocarbons which belong to the same homologous series. Give the name of each series.

CH_4, C_2H_2, C_2H_4, C_2H_6, C_4H_{10}, C_3H_4, C_3H_6

(e) What is meant by 'heteroatom'? Give examples. Write the names and formulae of two organic compounds containing different heteroatoms.

OR

How can ethanol and ethanoic acid be differentiated on the basis of their physical and chemical properties?

30. (5)

(a) Draw a diagram showing the germination of pollen on the stigma. Label the style, male germ cell, ovule and female germ cell.

(b) What happens to the following parts of a flower after fertilisation—ovule, zygote and ovary?