CBSE
Class X Science
Sample Paper 6

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.

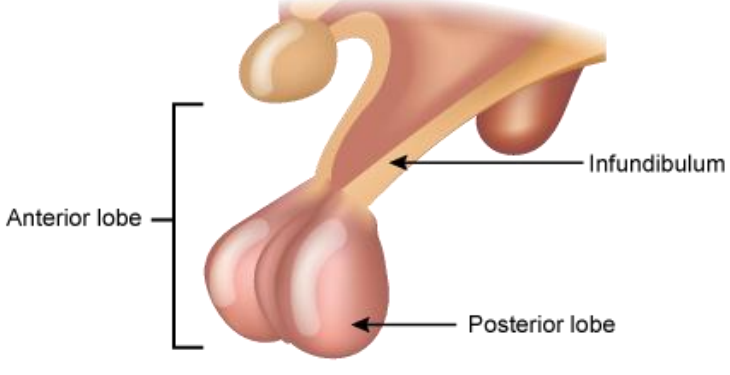
Section A

1. State one use of a solar cell. (1)

2. What is the SI unit of electric charge? (1)

3.

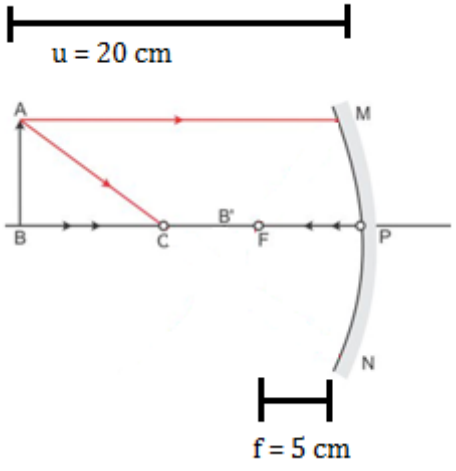
(a) Study the given figure and answer the questions that follow:



(i) Identify the endocrine gland. Where is it located? (1)

(ii) Why is the above gland referred to as the master gland? (1)

(b) Observe the diagram and answer the questions 3(b) (i) and 3 (b) (ii) based on the studied concepts.



(i) Complete the given ray diagram. (1)

(ii) Calculate the position of the image formed. (1)

4. Aluminium is the most abundant metal in the Earth's crust. It is a reactive metal, so it does not occur in the free state in nature. Aluminium is extracted from its ore by the process of electrolytic reduction.

(a) Name the main ore of aluminium and give its formula. (1)

(b) Name the substances which will form at the cathode and the anode during the electrolytic reduction of aluminium. (1)

(c) Name the metals which are extracted by using the process of electrolytic reduction. (1)

(d) How are metals at the bottom of the activity series obtained? (1)

5. The refractive index of glass for light going from air to glass is $^{3}/_{2}$. The refractive index of glass for light going from glass to air will be

(i) $^{3}/_{4}$

(ii) $^{4}/_{3}$

(iii) $^{6}/_{4}$

(iv) $^{4}/_{6}$ (1)

OR

A converging lens has a focal length of 20 cm. The power of the lens is

(i) +5 D

(ii) –0.05 D

(iii) –5 D

(iv) +0.05 D

6. When the diameter of a wire is doubled, its resistance becomes

(i) double

(ii) half

(iii) one-fourth

(iv) four times (1)

7. Normally, a current of 1 A flows through a TV. The correct fuse for the TV set will be

(i) 1A

(ii) 2A

(iii) 3 A

(iv) 5 A (1)

8. If a grasshopper is eaten by a frog, then the energy transfer would be from (1)

(i) Producer to decomposer

(ii) Producer to primary consumer

(iii) Primary consumer to secondary consumer

(iv) Secondary consumer to primary consumer

OR

The pH of a water sample collected from a river was found to be acidic in the range of 3.5–4.5. This river contained effluents discharged from nearby factories. The effluents of which of the following factories is most likely to cause lowering of the pH of river water?

(i) Soap and detergent factory

(ii) Lead battery-manufacturing factory

(iii) Plastic cup-manufacturing factory

(iv) Alcohol distillery

9. Providing a blueprint of body design and function is the role of (1)

(i) Protoplasm

(ii) DNA

(iii) Cytoplasm

(iv) RNA

10. Articles made of silver metal on exposure to air become black. This black layer is due the formation of (1)

(i) Silver oxide
(ii) Silver sulphide
(iii) Silver hydride
(iv) Silver carbonate

11. Identify the solution whose pH is more than 7. (1)
(i) NaCl
(ii) NH_4Cl
(iii) K_2SO_4
(iv) K_2CO_3

12. The main cause for abundant coliform bacteria in River Ganga is (1)
(i) Disposal of unburnt corpses into water
(ii) Discharge of effluents from metal industries
(iii) Washing and bathing activities
(iv) Immersion of ashes

OR

It is important to make small check dams across flooded gullies because they
a) Hold water for irrigation
b) Hold water and prevent soil erosion
c) Recharge groundwater
d) Hold water permanently
(i) (a) and (d)
(ii) (b) and (c)
(iii) (c) and (d)
(iv) (b) and (d)

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**: Evolution is the gradual change which takes place in organisms over millions of years and a new species is formed. (1)
Reason: Heredity is the transmission of characteristics or traits from parents to offspring.

14. **Assertion**: When objects are observed through hot air, they appear to be moving slightly.
Reason: The hotter air is optically denser and the colder air is optically rarer. (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) Why is copper wire not suitable for use as a fuse wire?

16. What do you call the secretion of the stomach? How does the wall of the stomach protect itself from the action of highly acidic HCl? (3)

17. Identify the types of reactions. (3)

(i) $AgNO_{3(aq)} + NaCl_{(aq)} \rightarrow AgCl_{(s)} + NaNO_{3(aq)}$

(ii) $CaO_{(s)} + H_2O \rightarrow Ca(OH)_{2(aq)}$

(iii) $KClO_{3(s)} \xrightarrow[MnO_2]{\Delta} 2KCl_{(s)} + 3O_{2(g)}$

18. $Cu + AgNO_3 \rightarrow CuNO_3 + Ag$

$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

$Zn + FeSO_4 \rightarrow ZnSO_4 + Fe$

From the above information, arrange the given metals in the increasing order of reactivity. Give reason for your choice. (3)

OR

What is a thermite reaction? How is it used to join railway tracks or cracked machine parts? Explain with the help of an example.

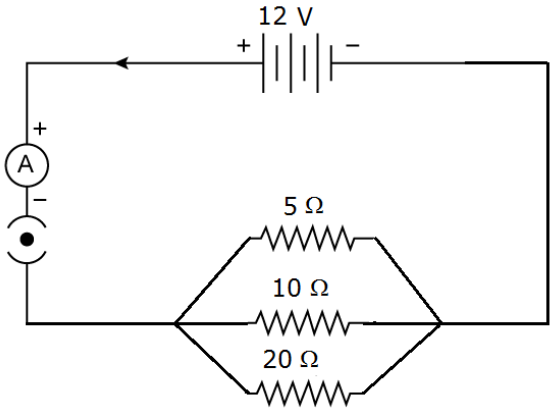
19. A blue-flowered plant denoted by BB is crossbred with a white-flowered plant denoted by bb. (3)

(a) State the colour of the flowers you would expect in the F_1 generation plants.

(b) What must be the percentage of white-flowered plants in the F_2 generation if flowers of F_1 plants are self-pollinated?

(c) State the expected ratio of the genotypes BB and Bb in the F_2 progeny.

20. In the circuit given below, three resistors of 5Ω, 10Ω and 20Ω, respectively, are connected across a battery of 12 V. (3)



Calculate:

(a) Current through the 5Ω and 20Ω resistors.

(b) Total current in the circuit if another resistor of 15Ω is connected.

(c) Compare the resistance of the three resistors connected in series.

OR

An electrical appliance is rated 220 V–1kW. What is the resistance of the appliance? If three such appliances run simultaneously for 6 hours, what is the energy consumed? Calculate the cost of running these appliances if the per unit cost is Rs 5.20.

21. What do you mean by ozone depletion? Mention the cause of ozone depletion in brief. (3)

OR

What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem? Where will the magnification be maximum? (3)

22. What are the probable damages due to ozone layer depletion? (3)

23. Answer the following: (3)

(a) What is the advantage of having two eyes instead of one?

(b) Explain the function of the iris.

(c) What is the difference in the defect of a person wearing spectacles of +1 D to a person wearing spectacles of –1 D?

24. (3)

(a) What change will you observe in the colour of red litmus paper when it is dipped into a solution of sodium sulphate? Give reason to explain your observation.

(b) A bottle filled with concentrated sulphuric acid up to the brim is left open in the atmosphere by mistake. Will there be any change in the level of liquid? Explain your answer with reason.

Section C

25. (5)

(a) Define magnetic field lines and write their characteristics.

(b) State the direction of magnetic field lines with a neat labelled diagram.

(c) Is the magnetic field same all around a bar magnet? Explain with reasons.

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

An element has the electronic configuration 2, 8, 2.

(a) What is the atomic number of this element?

(b) Is it a metal, non-metal or metalloid?

(c) Which of the elements Mg, O, P or Ar shows 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.

OR

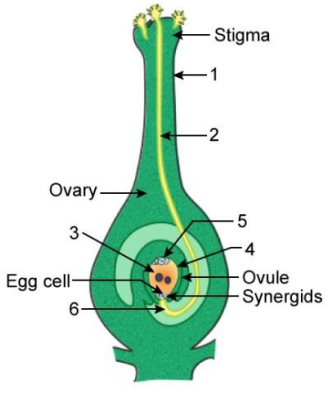
(a) State the Modern Periodic Law. How have the elements been arranged in the modern periodic table? Why is the position of hydrogen in the periodic table considered anomalous?

(b) An element X (2, 8, 2) combines separately with NO_3^- and $(PO_4)^{3-}$ radicals. Write the formulae of the compounds so formed. To which group of the periodic table does the element 'X' belong? Will it form covalent or ionic compounds with these radicals? How?

27. Briefly explain Darwin's theory of evolution. (5)

OR

Study this diagrammatic representation of the process of fertilisation, and answer the questions which follow: (5)



(a) Name the parts labelled 1, 2, 3, 4, 5 and 6.

(b) What happens to the ovary and the ovule after fertilisation?

(c) What is the function of the synergids?

(d) What part does the stigma play in the process of fertilisation?

28. An organic compound 'C' (molecular formula $C_2H_4O_2$) reacts with sodium metal to form a compound 'R' and evolves a gas which burns with a pop sound. Compound 'C' on treatment with alcohol 'A' in the presence of an acid forms a sweet-smelling compound 'S' (molecular formula $C_3H_6O_2$). Addition of NaOH to 'C' also gives 'R' and water. 'S' on treatment with NaOH solution gives back 'R' and 'A'. Identify 'C', 'R', 'A' and 'S', and write the reactions involved. (5)

29.

(a) What will happen to your throat when you sleep with your mouth open, especially when your nasal passages are plugged as a result of cold? (2)

(b) Why does a person who breathes rapidly and deeply for several seconds experience a short period of time in which respiration does not occur before normal breathing resumes? (3)

30. With a neat labelled diagram, enlist the new sign convention for spherical mirrors. (5)

OR

(a) Which gas is filled in an electric bulb and why?

(b) What do you mean by resistance of a conductor? On what factors do the resistance of a conductor depend and how? Write the SI unit of resistance.

(c) State Ohm's law.