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SAMPLE TEST PAPER 02 FOR CLASS X BOARD EXAM 2021

SUBJECT: SCIENCE

MAX. MARKS : 80

CLASS : X

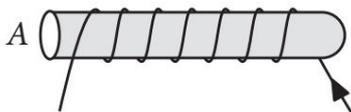
DURATION : 3 HRS

General Instructions:

- (i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
- (ii) Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
- (iii) Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (iv) Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (v) Section–D - question no. 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION – A

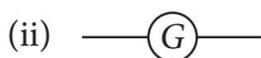
1. What is the role of the split ring in an electric motor?
2. The figure shows a solenoid wound on a core of soft iron. Will the end A be a N-pole or S-pole, when the current flows in the direction shown?



3. An electric wire of resistance 20 Q takes a current of 5 A. Calculate the heat developed in 30 s.

OR

What do the following symbols mean in circuit diagrams?



4. Name the substance which is absorbed in large intestine.

5. How do genes control traits?

OR

Name one trait which is inherited and one trait which is acquired.

6. What is root pressure?

OR

Define light reaction.

7. Which food product is preferred as primary substrate for respiration?

8. Give an example of a metal which (a) is a liquid at room temperature (b) can be easily cut with knife.

OR

Give reason why concentrated nitric acid can be stored in aluminium containers.

9. Give the electron dot structures for (a) CCl_4 and (b) C_2H_2 .
10. A spherical mirror produces an image of magnification -1 on a screen placed at a distance of 50 cm from the mirror. Write the type of mirror.

11. Wire A and wire B has the following ratios:

$$\frac{\text{length } L_A}{\text{length } L_B} = \frac{5}{18}; \frac{\text{diameter } D_A}{\text{diameter } D_B} = \frac{2}{3}; \frac{\text{resistivity } \rho_A}{\text{resistivity } \rho_B} = \frac{4}{9}.$$

What is the ratio of the resistance of wire A to the resistance of wire B?

12. Can ever there be a magnet with no pole?

OR

Can a magnet be created artificially?

13. Why copper-T cannot protect a woman from sexually transmitted diseases?

For question numbers 14-16, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- (a) Both A and R are true and R is correct explanation of the assertion.
 (b) Both A and R are true but R is not the correct explanation of the assertion.
 (c) A is true, but R is false.
 (d) A is false, but R is true.

14. **Assertion:** When a concave mirror is held under water, its focal length remain unchanged.

Reason: The focal length of a concave mirror depends on the medium in which it is placed.

15. **Assertion:** When a mixture of hydrogen and chlorine is placed in sunlight, hydrogen chloride is formed.

Reason: It is an example of combustion reaction.

OR

Assertion: On heating lead nitrate, nitrogen gas is produced.

Reason: Heating of lead nitrate is an example of decomposition reaction.

16. **Assertion:** There is always interaction between neighbouring or distant ecosystems.

Reason: An ecosystem is recognised as self - regulating and self - sustaining entity.

Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Read the following and answer any four questions from 17(i) to 17(v).

Element	Symbol	Character
Fluorine	F	Most non-metallic
Chlorine	Cl	Non-metallic
Bromine	Br	
Iodine	I	

- (i) Non-metallic character decreases down the group because
 (a) atomic size increases down the group
 (b) atomic size decreases down the group
 (c) atomic radii decreases down the group
 (d) None of these.

- (ii) Halogen belongs to
 (a) Group 1 (b) Group 2 (c) Group 17 (d) Group 18
- (iii) Which is the least electronegative element among the following?
 (a) F (b) Cl (c) Br (d) I
- (iv) The electronic configuration of chlorine is
 (a) 2, 8, 8 (b) 2, 8, 7 (c) 2, 8 (d) 2, 8, 8, 7
- (v) Number of valence electrons in halogen
 (a) 2 (b) 7 (c) 5 (d) 8

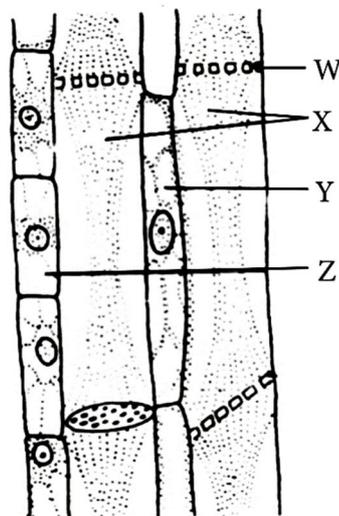
18. Read the following and answer any four questions from 18(i) to 18(v).

Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different number of electrons in their outermost shell. It was found that elements A and G combine to form an ionic compound. This compound is added in a small amount to almost all vegetable dishes during cooking. Oxides of elements A and B are basic in nature while those of E and F are acidic. The oxide of D is almost neutral.

- (i) To which group or period of the periodic table, do the listed elements belong?
 (a) 2nd period (b) 3rd period (c) 4th period (d) 5th period
- (ii) What happens in their metallic character when one moves from A to G?
 (a) Gradually decreases (b) Gradually increases (c) Remains same (d) None of these
- (iii) Which two of these elements could definitely be metals?
 (a) A and B (b) B and C (c) C and D (d) A and D
- (iv) Which one of the eight elements is most likely to be found in gaseous state at room temperature?
 (a) A (b) B (c) D (d) H
- (v) If the number of electrons in the outermost shell of elements C and G are 3 and 7 respectively, write the formula of the compound formed by the combination of C and G.
 (a) CG (b) CG₃ (c) CG₂ (d) C₂G₃

19. Read the following and answer any four questions from 19(i) to 19(v).

The transport of food from the leaves to other parts of the plant is called translocation. Phloem translocates the food made in the leaves. Phloem is made of many cells joined end to end to form long tubes as shown in given figure.



- (i) Identify the correct pair of labelled parts with the help of this figure.
- (a) W – Sieve plate, Y – Companion cell
 (b) X – Sieve plate, Z – Companion cell
 (c) Y – Sieve tubes, Z – Sieve plate
 (d) X – Companion cell, Y – Phloem parenchyma
- (ii) Name the labelled part which contains cytoplasm but no nucleus.
- (a) Sieve tube (b) Companion cell
 (c) Phloem parenchyma (d) Sieve plate
- (iii) In which direction phloem translocates the food?
- (a) Upward (b) Downward (c) Backward (d) Either (a) or (b)
- (iv) The phloem tissue in plants is responsible for the transport of
- (a) amino acids (b) hormones (c) sugar (d) all of these.
- (v) Which of the following is not a part of phloem?
- (a) Companion cells (b) Tracheids (c) Sieve plate (d) Sieve tube

20. Read the following and answer any four questions from 20(i) to 20(v).

When Deepak studied the electrical circuits and the current flowing through them, he became curious about the range of the currents we come across in daily life. He collected the data and presented in a tabular form as shown here.

S. No.	Description	Magnitude of current
1	Domestic appliance	Few amperes
2	Lightning	Ten thousand amperes
3	Nervous system	Microamperes
4	Galvanometer	Few milliamperes
5	Semiconductors	Few milliamperes

- (i) As domestic appliance carry electric current of the order of few amperes, the precaution to be taken while using electricity is
- (a) use insulated tools (b) use aluminium or steel ladder
 (c) use broken plugs (d) avoid water when working with electricity
- (ii) The electrical appliances in a house are connected in
- (a) series (b) parallel
 (c) either in series or parallel (d) both in series and parallel.
- (iii) Which of the following has maximum current?
- (a) Lightning (b) Galvanometer (c) Nervous system (d) Semiconductors
- (iv) The function of galvanometer in a circuit is
- (a) to detect potential difference
 (b) to detect electric current
 (c) to measure resistance
 (d) none of these.
- (v) In domestic electric circuit, the live wire is generally of
- (a) red colour (b) black colour (c) green colour (d) none of these.

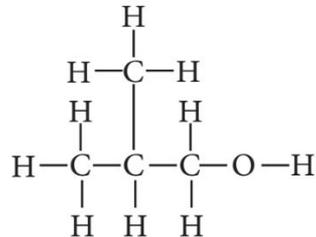
SECTION – B

21. Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a concave mirror. Mark the angle of incidence and angle of reflection on it.

OR

The absolute refractive indices of glass and water are $\frac{4}{3}$ and $\frac{3}{2}$ respectively. If the speed of light in glass is 2×10^8 m/s, calculate the speed of light in (i) vacuum, (ii) water.

22. Write the frequency of alternating current (A.C.) in India. How many times per second it changes its direction?
23. Define a food web. Write its significance for ecosystem.
24. When electricity is passed through an aqueous solution of sodium chloride, three products are obtained. Why is the process called chlor-alkali?
25. An organic molecule has the following structure:



- (i) To which homologous series does this molecule belong?
(ii) What is the general formula of this homologous series?
26. Grass → Grasshopper → Frog → Snake → Eagle
In the above food chain, which of the organism will have (i) maximum available energy? (ii) minimum available energy?

OR

Why are microorganisms like bacteria and fungi important in the ecosystem?

SECTION – C

27. When an object is placed at a distance of 25 cm from a mirror, the magnification is m_1 . The object is moved 15 cm farther away with respect to the earlier position and the magnification becomes m_2 . If $m_1/m_2 = 4$, then calculate the focal length of the mirror.
28. (a) Explain the terms: (i) Implantation (ii) Placenta
(b) What is the average duration of human pregnancy?
29. Name the mode of reproduction that ensures variation in the offspring. What mechanism, do you think, is actually responsible for variation leading to the survival of the species?
30. (i) Write Joule's law of heating.
(ii) Why tungsten is used for making bulb filaments of incandescent lamps?
(iii) Name any two electric devices based on heating effect of electric current.

OR

Two bulbs, one rated 100 W, 220 V and the other 60 W, 220 V are connected in parallel to electric mains supply. Find the current drawn by two bulbs from the line, if the supply voltage is 220 V.

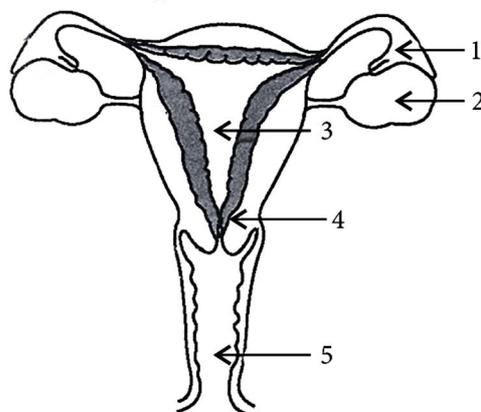
31. Differentiate between natural and artificial vegetative propagation in plants.
32. Write chemical equations for the reaction taking place when:
 (a) magnesium ribbon is burnt in a jar of oxygen.
 (b) potassium metal falls into a sink containing water.
 (c) steam is passed over heated aluminium.
33. (a) Write the name and formula of the 2nd member of homologous series having general formula C_nH_{2n-2} .
 (b) Write the formula of the functional group present in alcohols, aldehydes, ketones and carboxylic acids.

SECTION – D

34. Identify the type of chemical reaction taking place when:
 (i) Decomposition reactions require energy either in the form of heat or light or electricity for breaking down the reactants. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity.
 (ii) Take 3 g of barium hydroxide in a test tube, now add about 2 g of ammonium chloride and mix the contents with the help of a glass rod. Now touch the test tube from outside.
 (a) What do you feel on touching the test tube?
 (b) State the inference about the type of reaction occurred.
 (c) Write the balanced chemical equation of the reaction involved.
35. (a) Describe asexual reproduction in Amoeba.
 (b) Explain human male reproductive system with the help of a diagram.

OR

- (a) Identify the given diagram. Name the parts 1 to 5.



- (b) What is contraception? List three advantages of adopting contraceptive measures.

36. (i) Explain the following terms related to spherical lenses:
 (a) optical centre (b) centre of curvature (c) principal axis
 (d) aperture (e) principal focus (f) focal length
 (ii) A converging lens has focal length of 12 cm. Calculate at what distance should the object be placed from the lens so that it forms a virtual image at 48 cm.

OR

- (i) State the laws of refraction of light. Give an expression to relate the absolute refractive index of a medium with speed of light in vacuum.
 (ii) The refractive indices of water and glass with respect to air are $\frac{4}{3}$ and $\frac{3}{2}$ respectively. If the speed of light in glass is $2 \times 10^8 \text{ m s}^{-1}$, find the speed of light in air and water.