PRERNA EDUCATION
SCIENCE CLASS 10 SAMPLE PAPER

Maximum Time: 3 HR **M.M.80**

General Instructions :

(i) The question paper comprises five Sections, A, B, C, D and E. You are to attempt All the sections.
(ii) All questions are compulsory.
(iii) Internal choice is given in Sections B, C, D and E.
(iv) Questions number 1 and 2 in Section A are one-mark questions. They are to be answered in one word or in one sentence.
(v) Questions number 3 to 5 in Section B are two-marks questions. These are to be answered in about 30 words each.
(vi) Questions number 6 to 15 in Section C are three-marks questions. These are to be answered in about 50 words each.
(vii) Questions number 16 to 21 in Section D are five-marks questions. These are to be answered in about 70 words each.
(viii) Questions number 22 to 27 in Section E are based on practical skills.
Each question is a two-marks question. These are to be answered in brief.

1. If the potential difference across the two ends of a conductor is 5 V and the current through it is 0·2 A, then what is the resistance of the conductor ?
2. Write the major hazard of nuclear power generation.
3. Draw a labelled ray diagram to show the path of the reflected ray corresponding to the ray which is incident obliquely to the principal axis, towards the pole of a convex mirror. Mark the angle of incidence and angle of reflection on it.
4. What is the principle of an electric motor ? State the rule which is applied to determine the direction of force experienced by a current carrying conductor when kept in a magnetic field.
5. Name the acid present in ant sting and give its chemical formula. Also give the common method to get relief from the discomfort caused by the ant sting.

OR

6. A student prepared solutions of (i) an acid and (ii) a base in two separate beakers but forgot to label the solutions and litmus paper is not available in the laboratory. Since both the solutions are colourless, how will he distinguish between the two using (a) phenolphthalein and (b) methyl orange ?
7. What is a food chain ? Why is the flow of energy in an ecosystem unidirectional ? Explain briefly.

OR

(a) Why should National Parks be allowed to remain in their pristine form ?

(b) Why is reuse of materials better than recycling ?

8. (a) Write two water conducting tissues present in plants. How does water enter continuously into the root xylem ?

   (b) Explain why plants have low energy needs as compared to animals.

9. ''Nervous and hormonal systems together perform the function of control and coordination in human beings.'' Justify the statement.
10. Define genetics. Why is decrease in the number of surviving tigers a cause of concern from the point of view of genetics ? Explain briefly.
11. 2gm of ferrous sulphate crystals are heated in a dry boiling tube.

i. List any two observations.

ii. Name the type of chemical reaction taking place.
iii. Write balanced chemical equation for the reaction and name the products formed.

OR

You might have noted that when copper powder is heated in a china dish, the reddish brown surface of copper powder becomes coated with a black substance.

(a) Why has this black substance formed ?

(b) What is this black substance ?

(c) Write the chemical equation of the reaction that takes place.

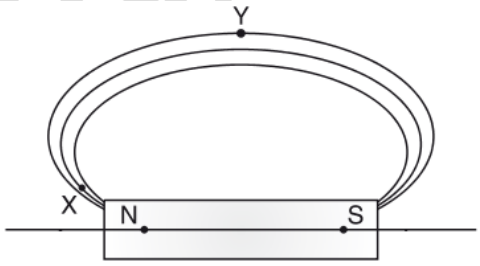
(d) How can the black coating on the surface be turned reddish brown ?

12. In an industrial process used for the manufacture of sodium hydroxide, a gas 'A' is formed as a by-product. The gas 'A' reacts with lime water to give a compound 'B' which is used as a bleaching agent in the chemical industry. Identify 'A' and 'B'. Also give the chemical equations of the reactions involved.
13. An ore on treatment with dilute hydrochloric acid produces brisk effervescence. Name the type of ore with one example. What steps will be required to obtain metal from the enriched ore ? Also write the chemical equations for the reactions involved in the process.
14. A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4 cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror ? Also calculate the size of the image formed.

OR

A real image $2/3^{rd}$ of the size of an object is formed by a convex lens when the object is at a distance of 12 cm from it. Find the focal length of the lens.

15. Magnetic field lines are shown in the given diagram. A student makes a statement that the magnetic field at 'A' is stronger than at 'B'. Justify this statement. Also redraw the diagram and mark the direction of magnetic field lines.



16. (a) Distinguish between cross-pollination and self-pollination. Mention the site and product of fertilization in a flower.

(b) Draw labelled diagram of a pistil showing the following parts : Stigma, Style, Ovary, Female germ cell

OR

(a) Draw a diagram of human female reproductive system and label the parts :

1. (i) which produce an egg.

2. (ii) where fertilization takes place.

(b) List two bacterial diseases which are transmitted sexually.

(c) What are contraceptive devices ? Give two reasons for adopting contraceptive devices in humans.

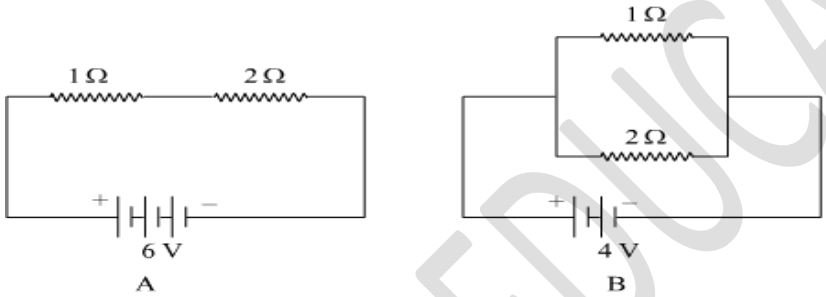
17. (a) How is equal genetic contribution of male and female parents ensured in the progeny ? Explain.

(b) Does the occurrence of diversity of animals on Earth suggest their diverse ancestry also ? Discuss this point in the light of evolution.

18. (a) A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find the position, nature and size of the image formed.

(b) Draw a labelled ray diagram showing object distance, image distance and focal length in the above case.

19. Compare the power used in 2 Ω resistor in each of the following circuits :



OR

A bulb is rated 40 W; 220 V. Find the current drawn by it, when it is connected to a 220 V supply. Also find its resistance. If the given bulb is replaced by a bulb of rating 25 W; 220 V, will there be any change in the value of current and resistance ? Justify your answer and determine the change.

20. Answer the following questions based on the elements with atomic number 3 to 9 :

(a) Name the element with smallest atomic radius.

(b) Name the element which shows maximum valency.

(c) Name the element which is a metalloid.

(d) Name the element which is most electropositive.

(e) Write the chemical formula of the compound formed when the elements of atomic number 6 and 8 react together.

21. (a) State the reason why carbon can neither form C^{4+} cations nor C^{4-} anions, but forms covalent bonds. Also state reasons to explain why covalent compounds

(i) are bad conductors of electricity.

(ii) have low melting and boiling points.

(b) Write the structural formula of benzene, C_6H_6.

OR

(a) Define the term 'isomer'.

(b) Two compounds have same molecular formula C_3H_6O. Write the name of these compounds and their structural formula.

(c) How would you bring the following conversions :

(i) Ethanol to ethene

(ii) Propanol to propanoic acid

22. A teacher gives a convex lens and a concave mirror of focal length of 20 cm each to his student and asks him to find their focal lengths by obtaining the image of a distant object. The student uses a distant tree as the object and obtains its sharp image, one by one, on a screen. The distances d_1 and d_2 between the lens/mirror and the screen in the two cases and the nature of their respective sharp images are likely to be

(a) (20 cm, 40 cm) and (erect and erect)

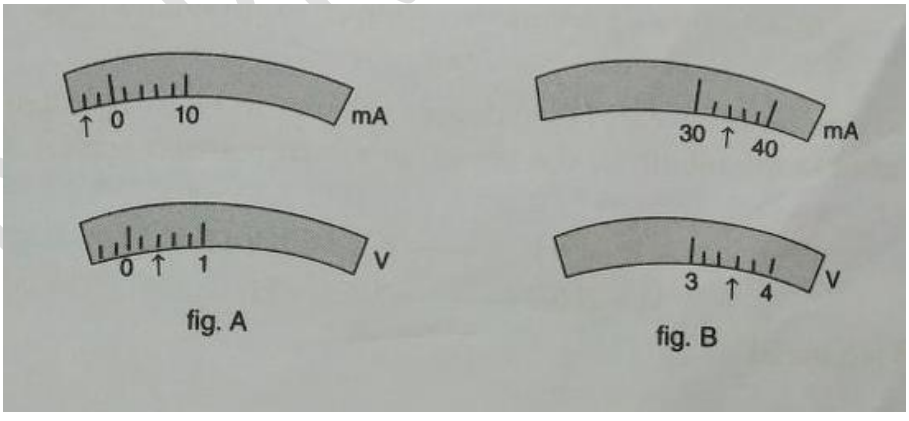
(b) (20 cm, 40 cm) and (inverted and inverted)

(c) (20 cm, 20 cm) and (inverted and inverted)

(d) (20 cm, 40 cm) and (erect and inverted)

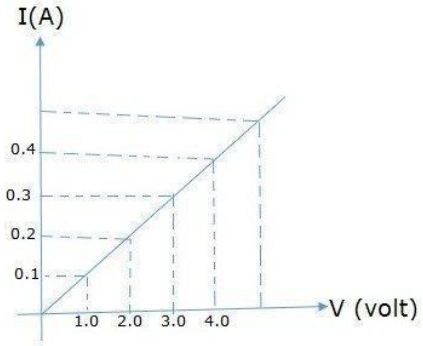
Give reason for your answer.

23. The rest position of the needles in a milliammeter and voltmeter, not in use, are as shown in Figure A. When a student uses these instruments in his experiment, the readings of the needles are in the positions shown in Figure B. Determine the correct values of current and voltage the student should use in his calculations.



In the experiment to study the dependence of current (I) on the potential difference (V) across a resistor, a student obtained a graph as shown.

i. What does the graph depict about the dependence of current on the potential difference ?
ii. Find the current that flows through the resistor when the potential difference across it is 2·5 V.



24. Draw labelled diagram to show the following parts in an embryo of a pea seed :

    Cotyledon, Plumule, Radical

    OR

    A student observed a permanent slide showing asexual reproduction in Hydra. Draw labelled diagram in proper sequence of the observations that must have been made by the student. Name the process of reproduction also.

25. In the experiment ''To prepare a temporary mount of a leaf peel to show stomata'', glycerine and safranin are used. When and why are these two liquids used ? Explain.
26. What would you observe on adding zinc granules to freshly prepared ferrous sulphate solution ? Give reason for your answer.
27. How is the presence of an acid tested with a strip of red litmus paper ?

OR

A student is performing an experiment to study the properties of acetic acid. Answer the following questions :

(i) Name the substance he must add to acetic acid to produce carbon dioxide.

(ii) Give the relevant chemical equation for the reaction.

(iii) How would he test CO_2 gas in the laboratory ?