CBSE
Class X Science
Board Paper – 2019 (Set 1)

Time allowed: 3 hours **Maximum marks: 80**

General Instructions:

1. The question paper comprises of two **Sections, A** and **B**. You are to attempt both the sections.
2. All questions are compulsory.
3. All questions of **Section A** and **Section B** are to be attempted separately.
4. There is an internal choice in **three** questions of **three** marks each, **two** questions of **five** marks each in Section A and in **one** question of **two** marks in Section B.
5. Question numbers **1** and **2** in **Section A** are **one mark** questions. These are to be answered in one word or in **one** sentence.
6. Question numbers **3** to **5** in **Section B** are **two marks** questions. These are to be answered in about **30 words each**.
7. Question numbers **6** to **15** in **Section C** are **three marks** questions. These are to be answered in about **50 words each**.
8. Question numbers **16** to **21** in **Section D** are **five marks** questions. These are to be answered in about **70 words each**.
9. Question numbers **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.

Section A

1. State Ohm's law. [1]

2. Name any two nutrients that the spent slurry has in the biogas plant. [1]

Section B

3. Draw a labelled ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror. Mark the angle of incidence and angle of reflection on it. [2]

4. A compass needle is placed near a current carrying straight conductor. State your observation for the following cases and give reasons for the same in each case: [2]
(a) Magnitude of electric current is increased.
(b) The compass needle is displaced away from the conductor.

5. Out of HCI and CH_3COOH, which one is a weak acid and why? Explain with the help of an example. [2]

OR

"Sodium hydrogen carbonate is a basic salt." Justify this statement. How is it converted into washing soda?

Section C

6. Define genetics. Why is decrease in the number of surviving tigers a cause of concern from the point of view of genetics? Explain briefly. [3]

7. 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 formed. [3]

OR

A real image 2/3rd 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.

8. 2 g of ferrous sulphate crystals are heated in a dry boiling tube. [3]
(a) List any two observations.
(b) Name the type of chemical reaction taking place.
(c) Write balanced chemical equation for the reaction and name the products formed.

OR

You might have noted that the when copper powder is heated in a china dish, the reddish brown surface of copper powder becomes coated with a black substance. [3]
(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?

9. What is a food chain? Why is the flow of energy in an ecosystem unidirectional? Explain briefly. [3]

OR

(a) Why should National Parks be allowed to remain in their pristine form?
(b) Why is reuse of materials better than recycling?

10. A white powder is added while baking cakes to make it soft and spongy. Name its main ingredients. Explain the function of each ingredient. Writ the chemical reaction taking place when the powder is heated during baking. [3]

11. Two circular coils P and Q are kept close to each other, of which coil P carries a current. What will you observe in the galvanometer connected across the coil Q [3]
(a) if current in the coil P is changed?
(b) if both the coils are moved in the same direction with the same speed?
Give reason to justify your answer in each case.

12. [3]
(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.

13. Why does the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron take place but not in the reverse direction? Explain. [3]

14. Mention the environmental consequences of the increasing demand for energy. List four steps you would suggest to reduce the consumption of energy. [3]

15. 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? [3]

SECTION D

16. [5]
(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 ethane
(ii) Propanol to propionic acid

17. [5]

(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.

18. [5]

(a) How does metallic character of elements in Modern Periodic Table vary on moving from

(i) left to right in a period?

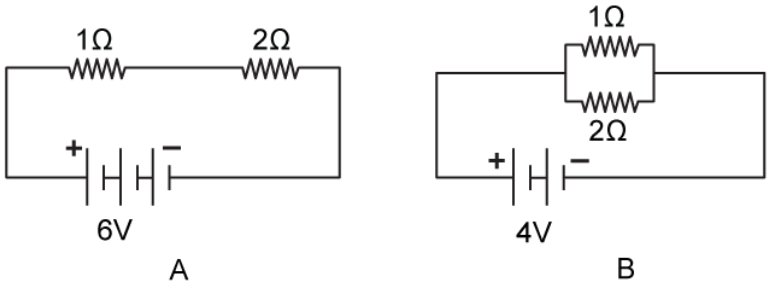
(ii) top to bottom in a group?

Explain with the help of an example in each case.

(b) If an element X is placed in group 14, what will be the nature of bond in its chloride? Write the chemical formula of the compound formed.

(c) An element X has mass number = 35 and number of neutrons = 18. What is the atomic number of X? Write electronic configuration of X and determine its valency.

19. Compare the power used in 2 Ω resistor in each of the following circuits: [5]



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. [5]

(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:
  (i) which produce an egg.
  (ii) where fertilization takes place.
(b) List two bacterial diseases which are transmitted sexually.
(c) What are contraceptive devices? Given two reasons for adopting contraceptive devices in humans.

21. [5]
(a) How do the following provide evidences in favour of evolution in organisms? Explain with an example for each.
  (i) Homologues organs
  (ii) Analogous organs
  (iii) Fossils
(b) Explain two methods to determine the age of fossils.

SECTION E

22. What would you observe on adding zinc granules to freshly prepared ferrous sulphate solution? Given reason for your answer. [2]

23. How is the presence of an acid tested with a strip of red litmus paper? [2]

OR

A student is performing an experiment to study the properties of acetic acid. Answer the following question:
(i) Name the substance he must add to acetic acid to produce carbon dioxide.
(ii) Given the relevant chemical equation for the reaction.
(iii) How would he test CO_2 gas in the laboratory?

24. 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 [2]
(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)

Given reasons for your answer.

25. 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 reading 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. [2]

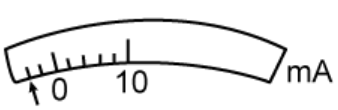


Figure A

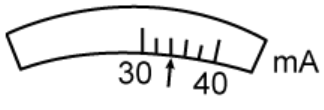


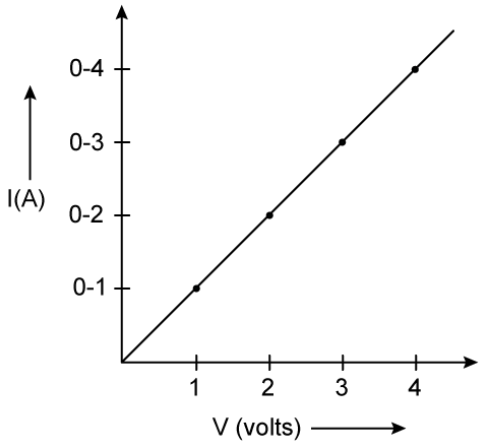
Figure B

OR

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.



26. In the experiment "To prepare a temporary mount of a leaf peel to show stomata", glycerin and safranin are used. When and why are these two liquids used? Explain. [2]

27. Draw labelled diagram to show the following parts in an embryo of a pea seed: [2]
Cotyledon, Plumule, Radical

OR

A student observed a permanent slid 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.