

## Class X 2022-23

### Science (086)

**Time: 3 Hours**

**Max. Marks: 80**

**General Instructions:**

1. This question paper consists of 39 questions in 5 sections.
  2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
  3. Section A consists of 20 Objective Type questions carrying 1 mark each.
  4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
  5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
  6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
  7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.
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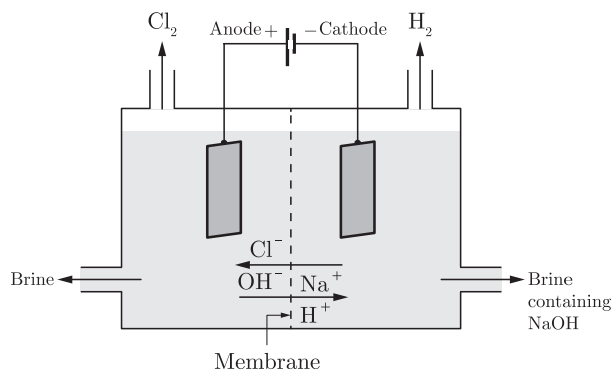
## SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 20.

1. Hard water is not available for an experiment in the school and its vicinity. However, some salts as given below are available in the school laboratory.
  1. Sodium Chloride
  2. Sodium Sulphate
  3. Calcium Chloride
  4. Calcium Sulphate
  5. Potassium Chloride
  6. Magnesium SulphateSelect from the following a group of these salts, each member of which may be dissolved in water to make it hard.
  - (a) 1, 2, 5
  - (b) 1, 3, 5
  - (c) 3, 4, 6
  - (d) 2, 4, 6

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2.

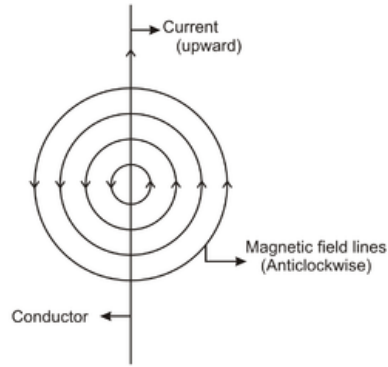


Which of the following gases formed at the anode and the cathode?

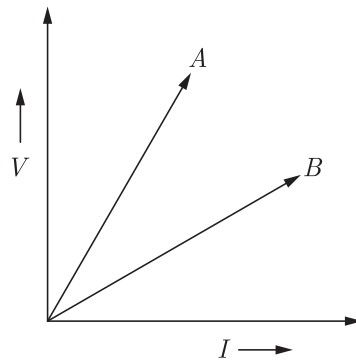
- (a) Chlorine, Hydrogen
  - (b) Hydrogen, Chlorine
  - (c) Hydrogen, Hydrogen
  - (d) Chlorine, Chlorine
3. In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?
- (a) Lead sulphate (insoluble)
  - (b) Lead acetate
  - (c) Ammonium nitrate
  - (d) Potassium sulphate
4. Which of the following is the observations of the chemical reaction?
- 1. Change in state
  - 2. Evolution of a gas
  - 3. Change in colour
  - 4. Change in temperature
- (a) 1, 2 and 3
  - (b) 1, 2 and 4
  - (c) 1, 3 and 4
  - (d) 1, 2, 3 and 4
5. A metal  $M$  of moderate reactivity is present as its sulphide  $X$ . On heating in air,  $X$  converts into its oxide  $Y$  and a gas evolves. On heating  $Y$  and  $X$  together, the metal  $M$  is produced.  $X$  and  $Y$  respectively are
- (a)  $X$  cuprous sulphide,  $Y$  cuprous oxide
  - (b)  $X$  cuprous sulphide,  $Y$  cupric oxide
  - (c)  $X$  sodium sulphide,  $Y$  sodium oxide
  - (d)  $X$  calcium sulphide,  $Y$  calcium oxide
6. Which of the following statements is true for acids?
- (a) Bitter and change red litmus to blue
  - (b) Sour and change red litmus to blue
  - (c) Sour and change blue litmus to red
  - (d) Bitter and change blue litmus to red



13. What is the maximum resistance which can be made using five resistors each of  $1/5 \Omega$ ?
- (a)  $1/5 \Omega$                       (b)  $10 \Omega$   
(c)  $5 \Omega$                               (d)  $1 \Omega$
14. The strength of magnetic field around a current carrying conductor is

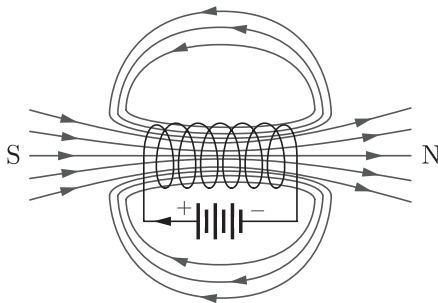


- (a) inversely proportional to the current but directly proportional to the square of the distance from wire.  
(b) directly proportional to the current and inversely proportional to the distance from wire.  
(c) directly proportional to the distance and inversely proportional to the current  
(d) directly proportional to the current but inversely proportional the square of the distance from wire.
15.  $V$ - $I$  graph for the two wires  $A$  and  $B$  are shown in the figure. If we connect both the wires one by one to the same battery which of the two will produce more heat per unit time ?



- (a) A  
(b) B  
(c) Both A and B  
(d) None of these

16. The strength of magnetic field inside a long current carrying straight solenoid is



- (a) more at the ends than at the centre
- (b) minimum in the middle
- (c) same at all points
- (d) found to increase from one end to the other

Question no. 17 to 20 are Assertion - Reasoning based questions.

17. **Assertion :** Changing of colour of copper from reddish brown to black is an example of reduction.  
**Reason :** Hydrogen is removed.
- (a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
  - (b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
  - (c) Assertion is True but the Reason is False.
  - (d) Both Assertion and Reason are False.
18. **Assertion :** The sex of the children will be determined by chromosome received from the father.  
**Reason :** A human male has one *X* and one *Y*-chromosome.
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
  - (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
  - (c) Assertion (A) is true but reason (R) is false.
  - (d) Assertion (A) is false but reason (R) is true.
19. **Assertion :** Egestion in amoeba takes place through a permanent membrane present in them.  
**Reason :** Cilia is absent in amoeba.
- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
  - (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
  - (c) Assertion is true but Reason is false.
  - (d) Both Assertion and Reason are false.
20. **Assertion :** Force experienced by moving charge will be maximum if direction of velocity of charge is perpendicular to applied magnetic field.  
**Reason :** Force on moving charge is independent of direction of applied magnetic field.
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
  - (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
  - (c) Assertion (A) is true but reason (R) is false.
  - (d) Assertion (A) is false but reason (R) is true.

## SECTION-B

Question no. 21 to 26 are very short answer questions.

21. What is meant by galvanisation ? Why is it done ?  
or  
Why do ionic compounds conduct electricity in molten state ?
22. State the function of Bowman's Capsule and glomerulus.
23. State the necessary conditions of autotrophic nutrition and name the by product. Mention the source of this by product.
24. In winter the frequency of urination is more. Why ?
25. Why does the colour of the sky appear blue ? Explain in brief.  
or  
What type of spectacles should be worn by a person having the defects of myopia as well as hypermetropia? How does it help ?
26. If a lake is contaminated with pesticides, which one of the following organisms will contain in its body the maximum concentration of pesticides and why ?  
Small fish, Pelicans, Zooplanktons, Phytoplanktons, Big fish.

## SECTION-C

Question no. 27 to 33 are short answer questions.

27. When hydrogen sulphide gas is passed through a blue solution of copper sulphate, the colour of the solution fades and a black precipitate is obtained.  
(a) Name the type of reaction mentioned above.  
(b) Why does the colour of the solution fade away ?  
(c) Write the chemical name of the black precipitate formed.
28. (a) Arrange the metals Zn, Mg, Al, Cu and Fe in decreasing order of reactivity.  
(b) What would you observe when you put  
(i) Some zinc pieces into blue copper sulphate solution ?  
(ii) Some copper pieces into green ferrous sulphate solution.  
(c) Name a metal which combines with hydrogen gas. Name the compound formed.
29. (a) Blood pressure is high in the arteries and low in the veins. Give the possible reason for such difference.  
(b) What is the major cause of high blood pressure ?  
(c) What may happen if a person is having a very high blood pressure ?

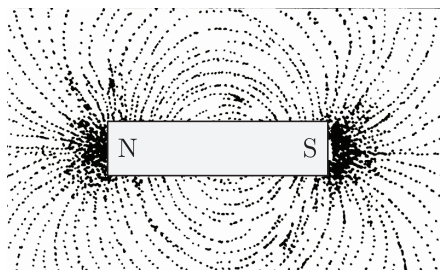
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or

- (i) Name the following :
- (a) The three carbon molecule that is formed due to break-down of glucose during respiration.
- (b) The nitrogenous waste that is removed from the blood in our Kidneys.
- (ii) How do unicellular organisms generally remove waste ?
30. A mirror is fitted in a wall of the AGRA FORT. When you stand at a proper location, a full-size image of the Taj Mahal can be seen in this mirror.
- (a) What kind of mirror is it ?
- (b) Draw a ray diagram for such a mirror when the object is at infinity.
31. You are given a convex lens of focal length 10 cm. Where will you place an object to get a real, inverted and highly enlarged image of the object. Draw a ray diagram.
32. Answer the following questions :
- (i) What is the direction of magnetic field lines outside a bar-magnet ?
- (ii) What is the SI unit of magnetic field ?
- (iii) What does crowding of magnetic field lines indicate ?

or

Study the diagram given below and answer the questions that follow :



- (a) Why do the iron filings arrange in such a pattern?
- (b) What does this pattern demonstrate ?
- (c) Why do the iron filings near the bar magnet seem to align in the shape of closed curves ?
33. How will you create an artificial aquatic ecosystem, which is self-sustainable?

## SECTION-D

Question no. 34 to 36 are Long answer questions.

34. (a) Write the molecular formula of an organic compound having its name suffixed with ‘-ol’ and having two carbon atoms in the molecule.  
With the help of balanced chemical equation indicate what happens when it is heated with excess of concentrated  $\text{H}_2\text{SO}_4$ .
- (b) Write names of the following compounds :
- (i)  $\text{HCOOH}$
- (ii)  $\text{CH}_2\text{COCH}_2\text{CH}_3$ .
- (c) Explain why carbon generally forms compounds by covalent bonds.

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or

- (a) Define catenation. Why no other element exhibits the properties of catenation to the extent seen in carbon compounds ?
- (b) Name the type of compound formed by the reaction of an organic acid and an alcohol. Write the chemical equation for the reaction involved.

35. (a) Draw the diagram of female reproductive system and match and mark the part(s) :
- (i) Where block is created surgically to prevent fertilization.
- (ii) Where Copper-T is inserted?
- (iii) Inside which condom can be placed.
- (b) Why do more and more people prefer to use condoms? What is the principle behind use of condoms?

or

What are the three categories of contraceptive methods? Write briefly about each.

36. (a) What is meant by the statement, "The resistance of a conductor is one ohm"?
- (b) Define electric power. Write an expression relating electric power, potential difference and resistance.
- (c) How many  $132\ \Omega$  resistors in parallel are required to carry 5 A on a 220 V line?

## SECTION-E

Question no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. Activity series : Relative reactivities of metals

Potassium	↓	Most reactive
Sodium		
Calcium		
Magnesium		
Aluminium		
Zinc		
Iron		
Lead		
Hydrogen		
Copper		
Mercury		
Silver		
Gold		Least reactive

- (i) What happens when iron nail is added to copper sulphate solution? What is the colour change ?
- (ii) Identify the metal which reacts with very dilute nitric acid to evolve hydrogen gas. Name one more metal not given in the above series which reacts in the same way with dilute nitric acid.
- (iii) Name one important ore of copper with its chemical formula.
- (iv) Which method is used to extract sodium from molten sodium chloride ?

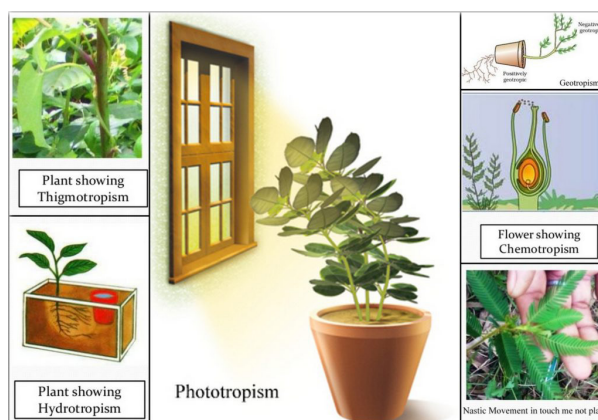
or

- (v) Which metal is used in the galvanization of iron ?

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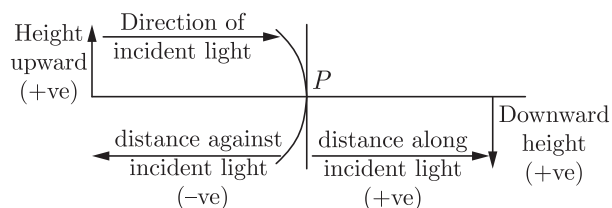


38. Nastic movements in plants are not directional movements. They are not dependent on the stimulus and are growth independent. For example, the leaves of a touch me not plant (*Mimosa pudica*), fold up immediately when touched. These kinds of changes occur due to the changes in the amount of water in the leaves. Depending on the quantity, they either swell up or shrink. Plant hormones or phytohormones are responsible for the control and coordination of plants. There are different types of hormones, which affect the growth of a plant. Phytohormones are chemical compounds which are released by stimulated cells. These hormones are diffused around the plant cells. They have a role in the cell division, cell enlargement, cell differentiation, fruit growth, falling of leaves, ripening of fruits, ageing of plants etc.



- (i) Name the phenomenon called for the movement in growth of plants.
  - (ii) What do you mean by nastic movement ?
  - (iii) What are the different types of harmonies of plants ?
- or**
- (iv) The plant hormone help in the cell growth at the shoot tips by elongating the cells and help in the growth process is :

39. While dealing with the reflection of light by spherical mirrors, we shall follow a set of sign conventions called the New Cartesian Sign Convention. In this convention, the pole (P) of the mirror is taken as the origin. The principal axis of the mirror is take as the  $x$ -axis of the coordinate system. In a spherical mirror, the distance of the object from its pole is called the object distance ( $u$ ). The distance of the image from the pole of the mirror is called the image distance ( $v$ ). Magnification produced by a spherical mirror gives the relative extent to which the image of an object is magnified with respect to the object size. It is expressed as the ratio of the height of the image to the height of the object. It is usually represented by the letter ( $m$ ).



- (i) How can you calculate the magnification of a spherical mirror ?
  - (ii) What does a negative sign in the value of magnification indicates?
  - (iii) Find the focal length of a convex mirror whose radius of curvature is 32 cm.
- or**
- (iv) Why does the height of the object is taken to be positive?