

**FIRST TERM EXAMINATION [2024-25]  
CLASS X – SCIENCE (086)**

**Max. Marks: 80**

**Time Allowed: 3 hours**

**General Instructions:**

- i. This question paper consists of 39 questions in 5 sections
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. 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.
- v. 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.
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

**SECTION A**

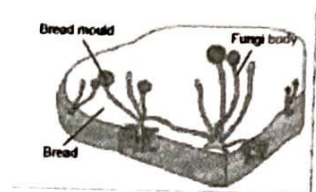
Select and write the most appropriate option out of the four options given for each of the questions 1 – 20. There is no negative mark for an incorrect response.

- Q1 Anita added a drop each of diluted acetic acid and diluted hydrochloric acid on pH paper and compared the colours. Which of the following is the correct conclusion?
- a) pH of acetic acid is more than that of hydrochloric acid.
  - b) PH of acetic acid is less than that of hydrochloric acid.
  - c) Acetic acid dissociates completely in aqueous solution.
  - d) Acetic acid is a strong acid
- Q2 In optics an object which has higher refractive index is called
- a) Optically rarer
  - b) Optically denser
  - c) Optical density
  - d) Refractive index
- Q3 On placing a copper coin in a test tube containing green ferrous sulphate solution, It will be observed that the ferrous sulphate solution:
- a) Turns blue and a grey substance is deposited on the copper coin.
  - b) Turns colourless and a grey substance is deposited on the copper coin.
  - c) Turns colourless and a reddish-brown substance is deposited on the copper coin.
  - d) Remains green with no change in the copper coin.
- Q4 Which of the following is responsible for the regulation of heart rate and breathing in humans?
- a) Cerebrum
  - b) Cerebellum
  - c) Medulla oblongata
  - d) Hypothalamus
- Q5 Which of the following oxides is acidic in nature?
- a) MgO
  - b) Na<sub>2</sub>O
  - c) CO<sub>2</sub>
  - d) Al<sub>2</sub>O<sub>3</sub>
- Q6 The reaction of magnesium with hydrochloric acid produces hydrogen gas. The mole ratio of magnesium to hydrogen gas produced is:
- a) 1:1
  - b) 1:2
  - c) 2:1
  - d) 1:4
- Q7 Copper is often used in electrical wiring. Which of the following/properties of copper contribute to its use?
- (i) High electrical conductivity
  - (ii) Low melting point
  - (iii) Ductility
  - (iv) Corrosion resistance
- a) (i) and (iii)
  - b) (ii) and (iv)
  - c) (i) and (ii)
  - d) (i) and (iv)
- Q8 The main function of abscisic acid in plants is
- a) to promote cell division.
  - b) to inhibit growth.
  - c) to promote growth of stem.
  - d) to increase the length of cells.

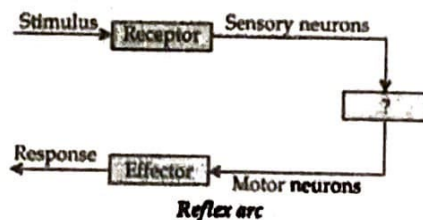
- Q9 In which of the following plant, bud in notches of leaves help in its propagation?  
 a) Radish      b) Bryophyllum      c) Bougainvillea      d) Jasmine
- Q10 Sodium carbonate is a basic salt because it is a salt of a  
 a) strong acid and strong base      b) weak acid and weak base  
 c) strong acid and weak base      d) weak acid and strong base
- Q11 The female reproductive part of the flower consists of  
 a) Stigma, Anther, Filament      b) Style, Ovary, Thalamus  
 c) Stigma, Ovary, Style      d) Anther, Corolla, Filament
- Q12 If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?  
 a) Proteins breaking down into amino acids  
 b) Starch breaking down into sugars  
 c) Fats breaking down into fatty acids and glycerol  
 d) Absorption of vitamins
- Q13 In the reaction:  $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$   
 Which of the following statements is correct?  
 a) Iron is oxidized and carbon is reduced  
 b) Iron oxide is reduced and carbon is oxidized  
 c) Both iron and carbon are oxidized  
 d) Both iron and carbon are reduced

- Q14 The optical phenomena, twinkling of stars, is due to  
 a) Atmospheric reflection      b) Total reflection  
 c) Atmospheric refraction      d) Total refraction

- Q15 The image shows the bread moulds on a bread. How these fungi obtain nutrition?  
 a) By using nutrients from the bread to prepare their own food.  
 b) By allowing other organisms to grow on the bread and then consuming them.  
 c) By breaking down the nutrients of bread and then absorbing them.  
 d) By eating the bread on which it is growing.



Q16



Give the missing term.

- a) Spinal cord      b) Brain      c) Cranial nerves      d) Relay nerves

Question No. 17 to 20 consist of two statements - Assertion (A) and Reason (R). Answer these options selecting the appropriate option given below :

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

Q17 Assertion (A): Sodium bicarbonate is used in baking.

Reason (R): Sodium bicarbonate releases carbon dioxide when heated, causing dough to rise.

- Q18 Assertion (A): Hormones are released by endocrine glands directly into the bloodstream.  
Reason (R): Hormones travel through the bloodstream to reach their target cells or organs.
- Q19 Assertion: Linear magnification of a mirror has no unit.  
Reason: The ratio of height of the image to the height of the object is the linear magnification produced by mirror.
- Q20 Assertion(A): In human beings, the respiratory pigment is hemoglobin  
Reason (R): It is a type of protein which has high-affinity for carbon dioxide.

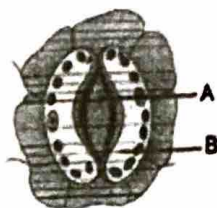
### SECTION-B

Question No. 21 to 26 are very short answer questions

- Q21 i)  $A + BC \rightarrow AC + B$   
ii)  $AB + CD \rightarrow AC + BD$

Identify the types of reaction mentioned above in i) and ii). Give one example for each type in the form of a balanced chemical equation.

- Q22 Study the given diagram: Name the parts 'A' and 'B' and state one function of each.



- Q23 How are involuntary actions and reflex actions different from each other?

- Q24 The refractive indices of three media are given below:

Medium	Refractive Index
A	1.6
B	1.8
C	1.5

A ray of light is travelling from A to B and another ray is travelling from B to C.

- a) In which of the two cases the refracted ray bends towards the normal?  
b) In which case does the speed of light increase in the second medium?

- Q25 The focal length of a concave mirror is 15cm. Find its radius of curvature. Also, write which mirror is used in solar furnace?

OR

State one important function of the following parts of the human eye :

- (i) Pupil (ii) Ciliary Muscles

- Q26 Write differences between binary fission and multiple fission in a tabular form as observed in cells of organisms. (4 points)

### SECTION-C

Question No. 27 to 33 are short answer questions

- Q27 In the electrolysis of aqueous sodium chloride:

- A. Identify the gases evolved at the anode and cathode.  
B. Name the process that occurs. Why is it called so?  
C. Illustrate the reaction of the process with the help of a chemical equation

OR

During the electrolysis of brine, a gas 'G' is liberated at anode. When this gas 'G' is passed through slaked lime, a compound 'C' is formed which is used for disinfecting drinking water.

- a) Write the formula of 'G' and 'C'  
b) State the chemical equation involved. (in the formation of compound 'C')  
c) What is the common name of compound 'C'?

- Q28 Give one example with equation each of

- a) Thermal decomposition b) Electrolytic decomposition c) Photolytic decomposition

- Q29 a) Write a balanced equation of photosynthesis and explain the events occurring during this process.  
b) Is it essential that these steps take place one after the other immediately? Justify with the help of an example.

OR

- a) Name two excretory products other than  $O_2$  and  $CO_2$  in plants.  
b) Explain how does the exchange of gases occur in plants across the surface of stems and roots.  
c) Name the mechanism of how water and minerals transported in plants? Explain in brief.
- Q30 a) Why is vegetative propagation essential in plants like banana and jasmine? Mention two advantages of vegetatively propagated plants have over plants produced from seeds?  
b) Name the various methods of vegetative propagation?

- Q31 If an object of 7cm height is placed at a distance of 12cm from a convex mirror of focal length 8cm, find the position, nature and height of the image.

OR

An object is placed at a distance  $2f$  in front of a convex lens. Draw a labelled ray diagram to show the formation of image. State two characteristics of image formed.

- Q32 The stars appear slightly higher from the actual position when viewed near horizon. Explain why it is so. Also draw a ray diagram to explain your answer.

- Q33 Draw a labelled ray diagram to show refraction through a rectangular glass slab. Also explain what is its lateral displacement?

#### SECTION-D

Question No. 34 to 36 are long answer questions.

- Q34 A person is unable to see objects distinctly placed within 50cm from his eyes.  
a) Name the defect of vision the person is suffering from.  
b) Mention the type of lens used by him for the correction of the defect and calculate its power. Assume near point of normal eye is 25cm.  
c) Draw a labelled diagram for the correction of the defect in the above case.

OR

- a) Draw ray diagrams to show formation of images when object is placed in front of a concave mirror:  
i) Between its pole and focus  
ii) Between its centre of curvature and focus  
b) Define the following in context of a diverging mirror:  
i) Principal Focus ii) Focal Length

- Q35 In the formation of a compound between atoms C and D, C loses three electrons and D gains two electrons.

- a) What is the nature of the bond between C and D?  
b) Suggest the formula of the compound formed and illustrate the electron transfer.  
c) Why do ionic compounds conduct electricity in solution but not in solid form?  
d) Explain why the melting point of magnesium oxide is high.  
e) Can covalent bonds form between two metals? Justify your answer.

OR

Give reasons for the following :

- a) Dry HCl gas does not turn the colour of dry blue litmus paper red  
b) Hydrogen is part of reactivity series of metals  
c) Hydrogen is not liberated when metals react with  $HNO_3$   
d) Milkman adds a very small amount of baking soda to fresh milk  
e) On reaction with water Calcium metal starts floating on it

- Q36
- Differentiate between nastic and tropic movements in plants (any 4 points)
  - Name the hormone which is secreted when growing plants detect light and explain why do plants appear to bend towards light.
  - Draw a **well labelled diagram** of a flower and **label**
    - Ovules
    - Filament
    - Stigma

OR

- State the source of secretion and function of the following hormones:
  - Thyroxin
  - Insulin
  - Growth hormone
- Give two limitations of electrical impulses for transmission of information.

### SECTION - E

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

- Q37 The curved surface of a spoon can be considered as a spherical mirror. A highly smooth polished surface is called mirror. The mirror whose reflecting surface is curved inwards or outwards is called a spherical mirror. Inner part works as a concave mirror and the outer bulging part acts as a convex mirror. The center of the reflecting surface of a mirror is called pole and the radius of the sphere of which the mirror is formed is called radius of curvature.

- When a concave mirror is held towards the sun and its sharp image is formed on a piece of carbon paper for some time, a hole is burnt in the carbon paper. What is the name given to the distance between the mirror and carbon paper?
  - Radius of curvature
  - Focal length
  - Principal focus
  - Principal axis
- The distance between pole and focus of a spherical mirror is equal to the distance between
  - pole and center of curvature
  - focus and center of curvature
  - pole and object
  - object and image
- If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it? Draw a labelled ray diagram to support your answer.

OR

The magnification produced by a spherical mirror is -3. Name the type of mirror used and nature of image formed by this mirror in the above case.

- Q38 The pH tells us about the hydrogen ion concentration of a solution. If pH is 7 it means solution is neutral. Solution having pH below 7 is acidic, lesser the pH higher is the H ion concentration and higher is the acidity. Solution having pH above 7 is basic in nature and higher the pH higher is basicity, pH of rainwater in an unpolluted area is about 5.6. However, in a polluted area, the pH may drop to as low as 4.0:

- Explain why rainwater is naturally acidic.
- How does pollution affect the pH of rainwater?
- What is the environmental impact of acidic rain?

OR

- Q39 c) Suggest a method to reduce the acidity of rainwater in polluted areas.
- All flowering plants show sexual reproduction. Sexual reproduction is the process of development of new organisms through the formation and fusion of gametes. The diversity of structures of the flowers and floral parts show an amazing range of adaptation to ensure formation of the end products of sexual reproduction, the fruits and seeds.

- What happens to the zygote after fertilization in flowering plants?
- What is germination?
- In a germinating seed, which parts are known as future shoot and future root? Mention the function of cotyledon.

OR

What is pollination? Name the types of pollination and how they are different from each other?