

**SCIENCE**  
**Sample Question Paper 7**  
**Class X | Code 086 | 2026-27**

**Time Allowed: 3 hours**

**Maximum Marks: 80**

**General Instructions**

This paper has 39 questions in three sections: A Biology, B Chemistry and C Physics.

All questions are compulsory. Three internal choices are provided in each section; attempt only one alternative wherever a choice is given.

Marks are shown against each question. Draw neat labelled diagrams wherever required.

For Questions 8, 9, 24 and 32, use the Assertion–Reason codes below:

- A. Both A and R are true, and R is the 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.

**SECTION A**

(Biology | Questions 1–16 | 30 marks)

- 1. A fish obtains oxygen mainly by:** **[1]**
- (A) breathing oxygen bubbles into lungs
  - (B) absorbing oxygen through scales only
  - (C) diffusion of dissolved oxygen across gills
  - (D) splitting water into hydrogen and oxygen
- 2. When blood glucose rises, the pancreas normally increases secretion of:** **[1]**
- (A) auxin
  - (B) insulin
  - (C) adrenaline
  - (D) testosterone
- 3. A human gamete normally contains:** **[1]**
- (A) 23 chromosomes
  - (B) 46 chromosomes
  - (C) 22 chromosome pairs
  - (D) 46 chromosome pairs
- 4. Which human organ produces ova?** **[1]**
- (A) Uterus
  - (B) Cervix
  - (C) Vagina
  - (D) Ovary
- 5. During photosynthesis, what happens to carbon dioxide and water as glucose is formed?** **[1]**
- (A) Carbon dioxide gains hydrogen, while water loses electrons.
  - (B) Carbon dioxide loses oxygen, while water gains oxygen.
  - (C) Carbon dioxide is oxidised, while water is reduced.
  - (D) Both carbon dioxide and water undergo reduction.

6. During urine formation, tubular reabsorption and secretion take place in the kidneys. Which of the following sets correctly indicates both the substances that are reabsorbed in the kidneys? [1]

- (A) Glucose and salts (B) Glucose and starch  
(C) Glycogen and salts (D) Glycogen and starch

7. A reduction in ozone in the upper atmosphere mainly increases exposure to: [1]

- (A) ultraviolet radiation (B) sound waves  
(C) radio waves (D) infrared radiation alone

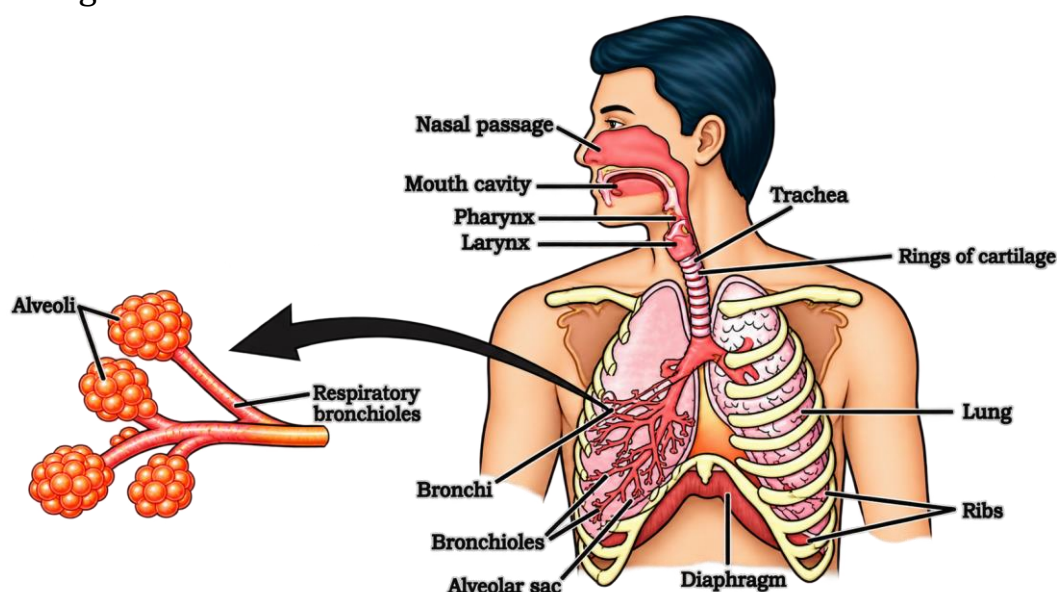
8. Assertion (A): A muscle can respond without receiving any signal in a coordinated reflex.

Reason (R): Motor neurons carry impulses to the muscle. [1]

9. Assertion (A): A seed contains a young plant and a reserve of food.

Reason (R): Stored food supports early growth before effective photosynthesis. [1]

10. Use the respiratory diagram to explain why the trachea branches repeatedly inside the lungs. [2]



11. Why are all  $F_1$  plants tall in a cross between pure tall and pure dwarf peas? [2]

12. Attempt either A or B. [2]

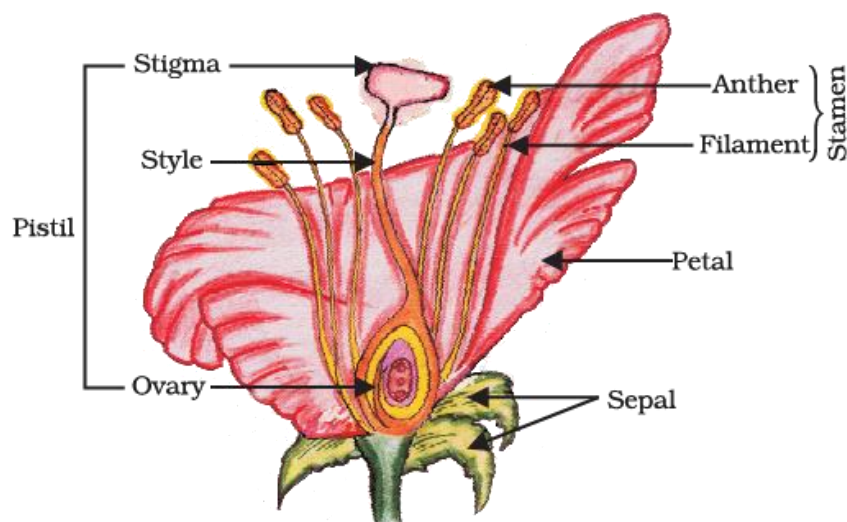
A. How does urine storage differ from urine formation? (2)

OR

B. Distinguish between a ureter and a urethra by the route of urine. (2)

13. Attempt either A or B. [3]

A. The flower shown has both reproductive parts. Explain how cross-pollination could occur, where gamete fusion happens and how a seed becomes protected. (3)



**OR**

B. Give three reasons why pollination may fail to produce viable seeds. (3)

**14.** Explain phototropism of a shoot in terms of stimulus, hormone distribution and growth. [3]

**15.** A Tiwari Academy activity compares chewed bread with bread mixed only with water. After equal time, the chewed sample gives a weaker iodine test. (a) Name the enzyme. (b) What is being tested? (c) Explain the result and purpose of the water sample. [4]

**16.** Give three linked biotic–abiotic interactions in a garden. [5]

Attempt either A or B for the remaining 2 marks.

A. Why is listing only living organisms inadequate? (2)

**OR**

B. Why is a food web better than one chain? (2)

## **SECTION B**

(Chemistry | Questions 17–29 | 25 marks)

**17.** The formula of washing soda is: [1]

(A)  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(B)  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$

(C)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

(D)  $\text{NaHCO}_3$

**18.** Which observation is evidence for formation of an insoluble product on mixing solutions? [1]

(A) The stopper is removed

(B) A precipitate appears

(C) The beaker remains transparent

(D) The solutions occupy less space only

**19.** Manjeet wants to wash clothes, but the water available is hard. He compares the action of soap and detergent in hard water, to decide which one to use for washing his clothes. He observes:

- Soap forms scum in hard water.
- Detergent produces lather easily in hard water.

Which of the following inferences is correct? [1]

(A)  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions react with soap, forming insoluble compounds, whereas detergents do not form such insoluble salts.

(B) Soap is acidic, and detergents are basic.

(C) Soap react with  $\text{Na}^+$  ions in hard water to form scum while detergents do not react with  $\text{Na}^+$  ions.

(D) Detergents form lather easily because they are ionic compounds and react with  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions while soaps do not react with hard water.

**20.** Phenolphthalein in a basic solution is: [1]

(A) colourless

(B) green

(C) blue-black

(D) pink

**21.** An element loses two electrons. The charge on the resulting ion is: [1]

(A) 1–

(B) 0

(C) 2+

(D) 2–

**22.** The ability of carbon to form chains with itself is called: [1]

(A) crystallisation

(B) catenation

(C) neutralisation

(D) calcination

**23.** A substance turns blue litmus red but does not turn dry blue litmus red in the absence of moisture. This shows that: [1]

(A) water helps it produce acidic ions

(B) litmus works only at high temperature

(C) all gases are bases

(D) dry paper always contains alkali

**24.** Assertion (A): Acid solutions can conduct electricity.

Reason (R): They contain mobile ions in water. [1]

**25.** Attempt either A or B. [2]

A. Name the two main ingredients of baking powder and state the role of the acidic ingredient. (2)

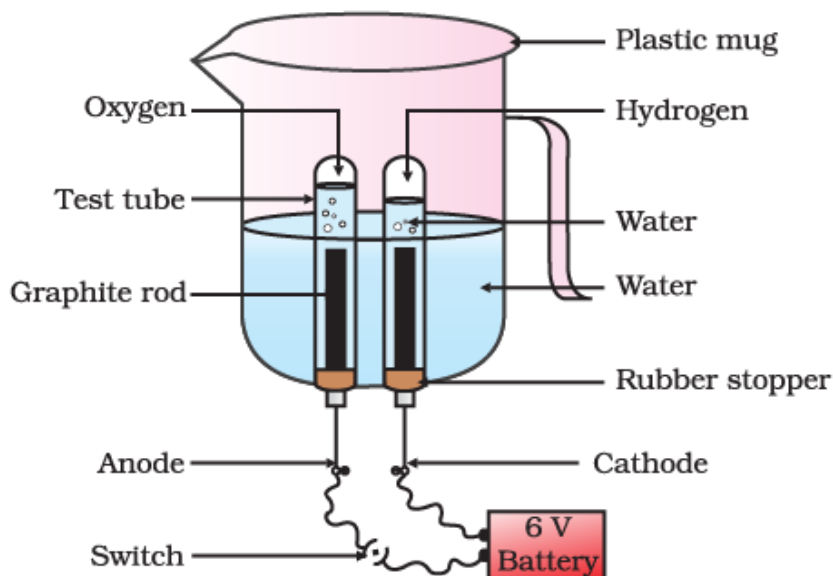
**OR**

B. What is an olfactory indicator? Give two examples. (2)

**26.** Write balanced equations showing the reactions of hydrochloric acid with sodium hydroxide, sodium carbonate and calcium carbonate. [3]

**27.** Attempt either A or B. [3]

A. Use the electrolysis diagram to predict the volume ratio of collected gases, write the equation and explain why a little acid is added. (3)



**OR**

B. Explain why electrolysis of water is decomposition, why both gases do not collect in equal volumes and how to test the smaller-volume gas. (3)

**28.** A student observes a clean blue burner flame after opening its air holes. With holes partly closed, the flame is yellow and deposits soot. (a) What is soot mainly? (b) Which setting gives more complete combustion? [4]

Explain the role of oxygen and one hazard of incomplete combustion. (2)

**29.** A student proposes  $C_2H_6 \rightarrow C_2H_4 + H_2$  as an addition reaction. Evaluate the classification, name both hydrocarbons and compare saturation. [5]

Attempt either A or B for the remaining 2 marks.

A. Explain why the reverse reaction is addition and give a catalyst. (2)

**OR**

B. Count the total covalent bonds in ethane and the shared electron pairs in ethene. (2)

## SECTION C

(Physics | Questions 30–39 | 25 marks)

**30.** The optical phenomenon responsible for twinkling of stars is: [1]

(A) chemical emission by air

(B) atmospheric refraction

(C) atmospheric reflection

(D) diffraction by clouds only

**31.** An electrical appliance rated 1000 W is operated at 250 V. What current does it draw? [1]

(A) 0.25 A

(B) 2.5 A

(C) 4.0 A

(D) 10 A

**32.** Assertion (A): A convex lens always produces a real image.

Reason (R): An object within its focal length can produce a virtual image. [1]

**33.** Why does a lemon in a glass of water appear larger than its actual size? [2]

**34.** Attempt either A or B. [2]

A. Why does a thick copper connecting wire remain relatively cool while a nichrome heating element becomes hot in the same series circuit? (2)

**OR**

B. Why are a bulb's support wires made much thicker than its filament? (2)

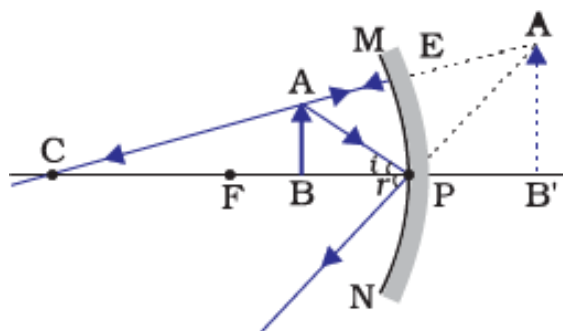
**35.** One half of a convex lens is covered with black paper. Explain the effect on the completeness, position and brightness of the image of an object at  $2F$ . [3]

**36.** A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor.

B. Explain how the magnetic field changes with distance from the conductor. [3]

**37.** Attempt either A or B. [3]

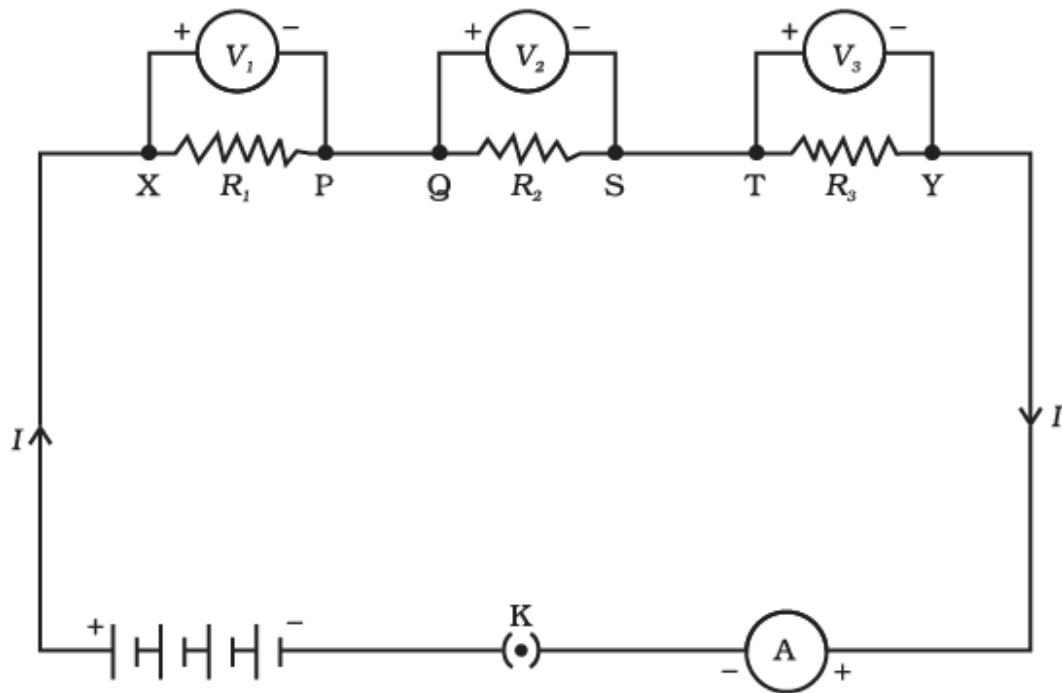
A. The concave mirror forms the illustrated erect image. For  $f = -15$  cm and  $u = -10$  cm, calculate image distance and magnification and state its nature.



**OR**

B. Why is this concave-mirror position suitable for magnifying a face, and why does moving too far away spoil the erect view?

**38.** The series circuit has voltmeters across  $4\ \Omega$ ,  $6\ \Omega$  and  $10\ \Omega$  resistors, connected to  $20\text{ V}$ . (a) Find total resistance. (b) Find current. **[4]**



Attempt either A or B for the remaining 2 marks.

A. Find the three voltage drops and verify their sum. **(2)**

**OR**

B. If the  $10\ \Omega$  resistor is removed leaving a gap, explain the ammeter and remaining voltage-drop readings. **(2)**

**39.** An electric kettle is rated  $1.5\text{ kW}$  at  $250\text{ V}$ . Calculate its current, resistance and energy used in four minutes. **[5]**

Explain whether a  $5\text{ A}$  fuse is suitable and name the heating law involved.