

SCIENCE
Sample Question Paper 10
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. The fluid that carries absorbed fats from the intestine and drains into blood is: [1]

- | | |
|------------|-----------|
| (A) urine | (B) bile |
| (C) saliva | (D) lymph |

2. Which gland secretes growth hormone? [1]

- | | |
|-------------------------|-------------|
| (A) Adrenal cortex only | (B) Ovary |
| (C) Pituitary | (D) Thyroid |

3. Which part of the brain regulates involuntary actions such as vomiting? [1]

- | | |
|---------------------|-------------------|
| (A) Optic nerve | (B) Medulla |
| (C) Cerebellum only | (D) Cerebrum only |

4. Failure of fertilisation normally leads to breakdown of the: [1]

- | | |
|------------------------------|------------------------------|
| (A) thickened uterine lining | (B) oviduct wall permanently |
| (C) ovary wall permanently | (D) vaginal wall |

5. 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

6. The Vas deferens and the Oviduct are both targets for surgical contraception (Vasectomy and Tubectomy respectively). Analysing the process of reproduction, what common biological event is prevented by blocking both these structures? [1]

- (A) The production of gametes (sperm and egg).
- (B) The implantation of the fertilized egg into the uterine wall.
- (C) The successful meeting and fusion of the male and the female gametes.
- (D) The release of hormones - testosterone and estrogen.

7. If a dominant allele is present in only one of a gene pair, its trait is normally: [1]

- (A) removed during respiration
- (B) expressed
- (C) always absent
- (D) converted to recessive

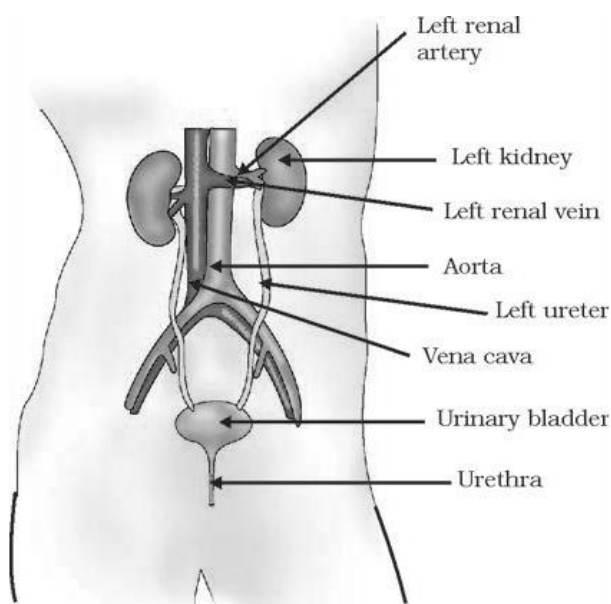
8. Assertion (A): Adrenaline increases the supply of oxygen to working muscles.
Reason (R): It can increase breathing rate and heart rate. [1]

9. Assertion (A): An aquarium needs maintenance even though it contains living organisms.

Reason (R): It may not have all the self-regulating interactions of a natural ecosystem. [1]

10. Attempt either A or B. [2]

A. Use the excretory-system diagram to trace the route of urine after it leaves a kidney.



OR

B. Why are both a renal artery and renal vein associated with each kidney in the figure?

11. State two roles of testosterone in human males. [2]

12. Why does food need to be digested before absorption? Give one example of a conversion involved. [2]

13. Attempt either A or B. [3]

A. A true-breeding round-seeded pea is crossed with a wrinkled-seeded pea. Explain the F_1 genotype, appearance and outcome of crossing F_1 with a wrinkled plant.

OR

B. How can a cross distinguish a round-seeded plant of genotype RR from one of genotype Rr?

14. Describe three methods of contraception that act at different stages of reproduction. [3]

15. A Tiwari Academy waste audit finds food scraps mixed with plastic spoons. (a) Which is biodegradable? (b) Name its decomposers. (c) Propose separate disposal routes with reasons. [4]

16. Describe three ways plants handle wastes. [5]

Attempt either A or B for the remaining 2 marks.

A. Distinguish excretion and egestion.

OR

B. Why is oxygen a photosynthetic by-product but a respiratory requirement?

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which metal is obtained from cinnabar? [1]

(A) Aluminium

(B) Iron

(C) Sodium

(D) Mercury

18. A balanced equation obeys the law of conservation of: [1]

(A) colour

(B) temperature

(C) mass

(D) volume in every reaction

19. Which substance is used to remove permanent hardness of water? [1]

(A) Washing soda

(B) Common salt alone

(C) Ethanol

(D) Glucose

20. Chameleons contain crystals that reflect light and produce colour. Adjusting the spacing between these crystals, they can alter the wavelengths of light reflected, thus changing their skin colour. Based on the above information, we can infer that the change in colour by chameleons is a: **[1]**

- (A) chemical change because change in colour takes place.
- (B) chemical change because wavelength of reflected light changes.
- (C) physical change because the space between crystals is adjusted.
- (D) physical change because light is reflected by crystals.

21. Which process heats a carbonate ore strongly in limited or no air? **[1]**

- (A) Roasting
- (B) Galvanisation
- (C) Electroplating
- (D) Calcination

22. A sweet-smelling product formed from an alcohol and a carboxylic acid is an: **[1]**

- (A) ore
- (B) amalgam
- (C) ester
- (D) alkali

23. An iron object coated with paint is protected mainly because paint: **[1]**

- (A) removes all carbon from iron
- (B) limits contact with air and moisture
- (C) converts iron into gold
- (D) increases iron's reactivity

24. Assertion (A): An acidic soil may be treated with lime.

Reason (R): Lime is basic and can neutralise excess acidity. **[1]**

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

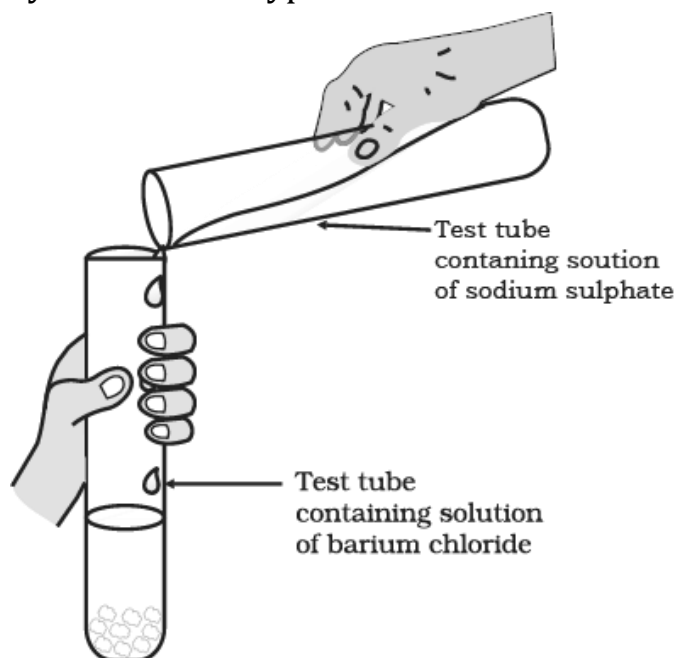
A. Distinguish between a base and an alkali.

OR

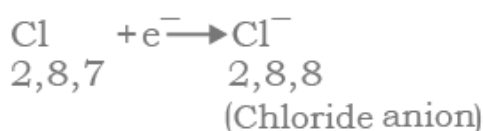
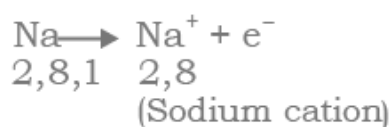
B. Explain why all alkalis are bases but all bases are not alkalis, with an example.

26. Explain why sodium chloride has a high melting point and conducts electricity in two particular conditions. **[3]**

27. Solutions are mixed as shown. Write the molecular equation, explain the precipitate and identify the reaction type. [3]



28. The diagram shows transfer of an electron between sodium and chlorine. (a) Give the resulting ion charges. (b) Explain the stable outer-shell arrangement. [4]



Attempt either A or B for the remaining 2 marks.

A. Why is the compound neutral overall and why is its melting point high?

OR

B. Explain why solid NaCl and molten NaCl differ in electrical conduction.

29. Explain ionic bonding between an element of electronic configuration 2,8,1 and one of configuration 2,7. [5]

Attempt either A or B for the remaining 2 marks.

A. Predict melting behaviour and conduction of the solid.

OR

B. Predict conduction after dissolving in water and explain the change.

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. A spherical mirror has radius of curvature 20 cm. The magnitude of its focal length is: [1]

- (A) 40 cm (B) 5 cm
(C) 10 cm (D) 20 cm

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 ray entering glass normally from air changes speed without changing direction.

Reason (R): At normal incidence its angle of refraction is zero. [1]

33. Which is scattered more strongly by very small particles, red or blue light? Give the wavelength-based reason. [2]

34. Attempt either A or B. [2]

A. A wire has resistance $10\ \Omega$, length 2 m and area $0.4\ \text{mm}^2$. Calculate resistivity.

OR

B. A wire's length and cross-sectional area are both doubled at unchanged temperature. Predict its resistance and resistivity.

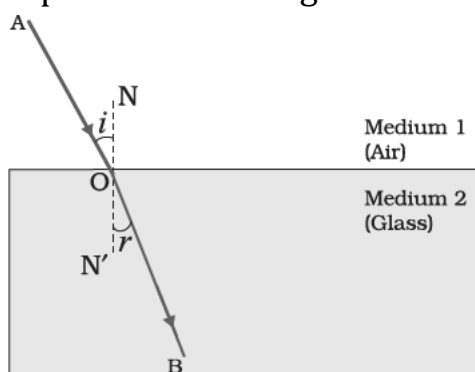
35. Explain the role of ciliary muscles and how ageing can affect near vision. [3]

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]

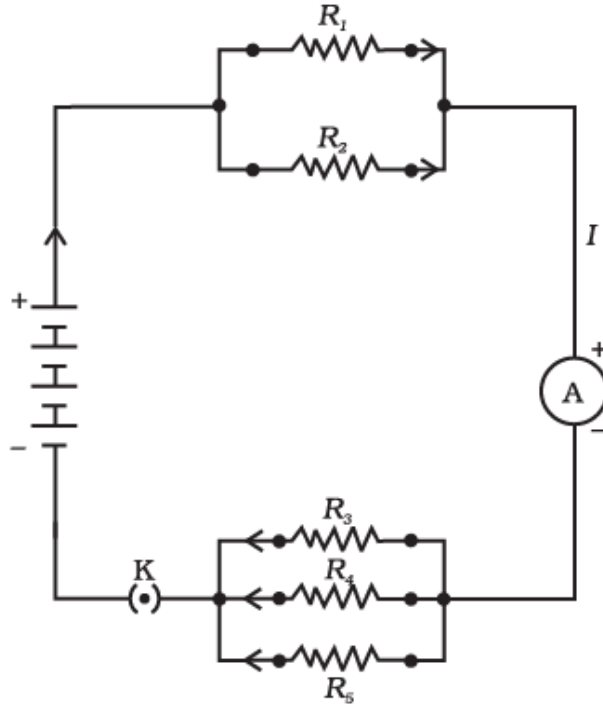
A. In the air–glass diagram, glass has refractive index 1.60. Determine speed in glass, compare i and r , and explain the bending.



OR

B. Explain why optical density cannot be inferred merely from the mass of a glass block.

38. In the mixed circuit, $R_1 = 10\ \Omega$, $R_2 = 40\ \Omega$, $R_3 = 30\ \Omega$, $R_4 = 20\ \Omega$ and $R_5 = 60\ \Omega$; supply is 12 V. (a) Find the equivalent of R_1 and R_2 . (b) Find the equivalent of R_3 , R_4 and R_5 . **[4]**



Find the total resistance and ammeter current.

39. An appliance label reads 12 V, 24 W. It is supplied by a suitable source. Calculate current, operating resistance and charge passing in three minutes. **[5]**

Attempt either A or B for the remaining 2 marks.

A. A $6\ \Omega$ resistor is placed in series across the same 12 V source. Find current and appliance power, assuming fixed resistance.

OR

B. Explain why placing another $6\ \Omega$ resistor in parallel instead does not reduce the appliance current for an ideal source.