Sample Paper 08

Class X 2026-27

Science (086)

Time: 3 Hours **Max. Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
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.

SECTION-A

1. In the human circulatory system, deoxygenated blood from the body returns to the heart. Which chamber of the heart is the first to receive this deoxygenated blood?

(a) Left Atrium (b) Right Atrium
(c) Left Ventricle (d) Right Ventricle

2. Nerve impulses are transmitted from one neuron to the next across a specialized junction. What is this microscopic gap between two neurons called?

(a) Myelin sheath (b) Axon
(c) Cell body (d) Synapse

3. Flowers can be classified as unisexual or bisexual. Which of the following plants typically bears unisexual flowers?

(a) Hibiscus (b) Mustard
(c) Papaya (d) Pea

4. In pea plants, purple flowers (P) are dominant over white flowers (p). If a heterozygous plant (Pp) is crossed with a white-flowered plant (pp), what percentage of the offspring will have white flowers?

(a) 0% (b) 25%
(c) 50% (d) 100%

5. The accumulation of certain harmful chemicals in the tissues of organisms at successively higher levels in a food chain is known as:

(a) Decomposition (b) Eutrophication
(c) Biomagnification (d) Transpiration

6. Consider the following statements about contraceptive methods:

(i) Oral pills are hormonal preparations that prevent the release of an egg from the ovary (ovulation).
(ii) Using a condom is a barrier method that can also prevent the transmission of Sexually Transmitted Diseases (STDs).
(iii) Copper-T is a surgical method used to permanently block the fallopian tubes.
(iv) A vasectomy is a surgical procedure performed on females to prevent pregnancy.

Which of the above statements are correct?

(a) (i) and (ii)
(b) (iii) and (iv)
(c) (i), (ii), and (iii)
(d) All are correct.

7. The complete digestion of fats in the human alimentary canal results in fatty acids and glycerol. Which enzyme is primarily responsible for this conversion?
(a) Amylase
(b) Pepsin
(c) Trypsin
(d) Lipase

8. **Assertion (A) :** The brain and spinal cord are components of the Peripheral Nervous System (PNS).
Reason (R) : The PNS is responsible for connecting the Central Nervous System (CNS) to the limbs and organs.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A) :** An ecosystem with a complex food web is more stable than one with a simple food chain.
Reason (R) : In a food web, most organisms have multiple food sources, which prevents the collapse of the ecosystem if one food source diminishes.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

10. Transpiration is often described as a 'necessary evil' for plants. Justify this statement with one point explaining why it is 'necessary' and one point for why it is an 'evil'.

11. A. State the role of the following enzymes in the human digestive system: (i) Pepsin and (ii) Lipase.

OR

B. Differentiate between xylem and phloem on the basis of
(i) the direction of flow and
(ii) the substance transported.

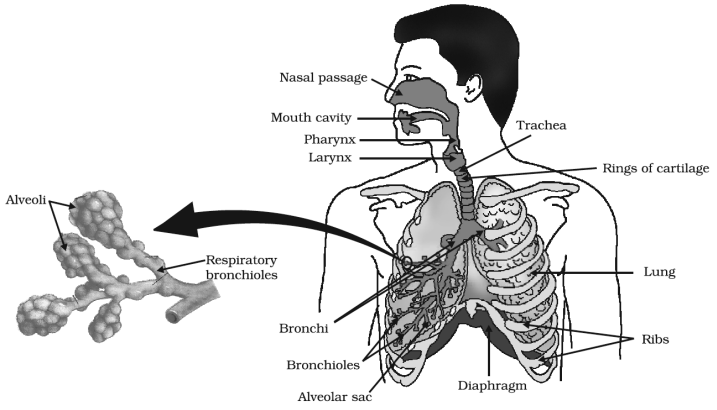
12. Why is a food web considered a more stable and realistic model for an ecosystem compared to a linear food chain? Give two reasons.

13. What are nastic movements in plants? How do they differ from tropic movements in terms of the stimulus's direction? Give one example of a nastic movement.

14. What is specialization? Describe any two factors that can lead to the formation of a new species.

15. A student is studying the process of respiration in humans. Refer to the diagram of the human respiratory system to the questions.

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A. What is the function of the C-shaped rings of cartilage present in the trachea?

OR

B. Describe the mechanism of exhalation in humans, involving the movement of the diaphragm and rib cage. C. Why is it advisable to breathe through the nose rather than the mouth?

16. Student to attempt wither option A or B

A. (i) What is meant by the term 'alternation of generations' in the life cycle of a plant?
(ii) Name a plant group that clearly shows this phenomenon.
(iii) Differentiate between the sporophyte and gametophyte generation in plants.

OR

B. (i) Draw a labelled diagram showing the longitudinal section of a flower.
(ii) What are the functions of sepals and petals?
(iii) How does the process of fertilization occur in a flower after pollination?

SECTION-B

17. For the reaction of copper with concentrated sulphuric acid, identify the correct values for 'p' and 'q'.
Equation: $\mathrm{pCu(s) + 2H_2SO_4(conc.) \rightarrow CuSO_4(aq) + qSO_2(g) + 2H_2O(l)}$

(a) p = 2, q = 1
(b) p = 1, q = 2
(c) p = 2, q = 2
(d) p = 1, q = 1

18. Soda-acid fire extinguishers work by producing carbon dioxide gas, which cuts off the oxygen supply to a fire. The gas is produced by the reaction of sulphuric acid with:

(a) Sodium carbonate
(b) Calcium carbonate
(c) Sodium hydroxide
(d) Sodium hydrogencarbonate

19. Which metal forms a thin, tough, non-porous, and non-reactive layer of its oxide on its surface, which protects the metal from further corrosion?

(a) Iron
(b) Aluminium
(c) Copper
(d) Gold

20. A student observes that when a few drops of lemon juice are added to a solution of baking soda, brisk effervescence occurs. This is due to the evolution of:

(a) Hydrogen gas
(b) Oxygen gas
(c) Carbon dioxide gas
(d) Sulphur dioxide gas

21. The pH of human blood is maintained within a very narrow range for the body to function properly. What is the typical pH value of human blood?

(a) 6.4 (b) 7.0
(c) 7.4 (d) 8.0

22. Zinc oxide is an amphoteric oxide. When it reacts with a hot, concentrated solution of sodium hydroxide, the salt formed is:

(a) Zinc Hydroxide (b) Sodium Oxide
(c) Sodium Zincate (d) Zinc Sulphate

23. When solid lead nitrate is heated strongly in a dry test tube, a reddish-brown gas is evolved. This reaction is a classic example of:

(a) Displacement (b) Thermal decomposition
(c) Combination (d) Photolytic decomposition

24. **Assertion (A) :** Alkanes are generally considered chemically unreactive or 'paraffins'.
Reason (R) : Alkanes are saturated hydrocarbons containing only strong C-C and C-H single covalent bonds which are difficult to break.

(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.

25. Answer the following based on the properties of ionic compounds:

(a) Why do ionic compounds generally have high melting points?
(b) Explain why ionic compounds are often brittle and break into pieces when pressure is applied.

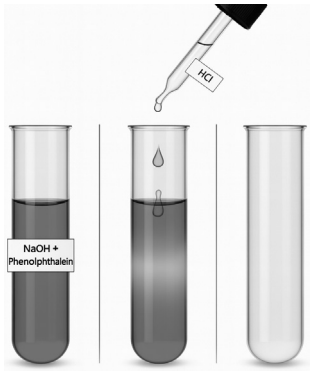
26. Attempt either option A or B.

(A) Explain how the following methods help in preventing the corrosion of an iron object:
  (i) Oiling or Greasing
  (ii) Galvanisation
  (iii) Making an alloy like stainless steel

OR

(B) Draw a neat and fully labelled diagram showing the setup for the electrolytic refining of an impure copper rod. Your diagram must show the anode, cathode, electrolyte, and the collection of anode mud.

27. A student takes 2 mL of dilute sodium hydroxide solution in a test tube and adds two drops of phenolphthalein indicator. He then adds dilute HCl solution to this test tube drop by drop.



(a) What is the initial colour of the solution after adding phenolphthalein?
(b) What colour change is observed as he adds HCl dropwise? Why does this change occur?
(c) What is the specific name given to this reaction between an acid and a base? Write the balanced chemical equation for it.

28. Salts belonging to the same family share a common positive or negative radical. Consider the salts: Sodium Sulphate (Na_2SO_4), Potassium Sulphate (K_2SO_4), and Copper Sulphate ($CuSO_4$).
(a) Identify the family to which these three salts belong.
(b) Which of these salts will form a neutral solution in water and which will form an acidic solution?
(c) What would be the colour of the Copper Sulphate solution? What visual change would occur if a clean strip of zinc metal is placed in it?

OR

The "water of crystallisation" is the fixed number of water molecules chemically attached to one formula unit of a salt in its crystalline form.
(a) Give the chemical formula, common name, and colour of hydrated copper sulphate.
(b) What happens when this salt is heated strongly in a boiling tube? Write a balanced chemical equation for this change.
(c) What will you observe if a few drops of water are added to the substance obtained after heating?

29. Attempt either option A or B.
(A) Ethane (C_2H_6) and Ethene (C_2H_4) are two simple hydrocarbons with different degrees of saturation.
(a) To which homologous series does ethane belong?
(b) Which of the two is unsaturated? Why is it called so?
(c) Which of these two will undergo an addition reaction? Write the chemical equation for its reaction with chlorine (Cl_2).
(d) Which of these two will undergo a substitution reaction? Write the chemical equation for its reaction with chlorine (Cl_2) in the presence of sunlight.
(e) Draw the electron dot structure for the ethane (C_2H_6) molecule.

OR

(b) Homologous series is a fundamental concept in organic chemistry.
(a) Define the term 'homologous series'.
(b) List any two characteristics of a homologous series.
(c) Write the molecular formula of the second and third members of the homologous series whose first member is methane (CH_4).
(d) Write the name and formula of the fourth member of the alkyne series.
(e) What is the difference in the molecular mass between any two adjacent homologues?

SECTION-C

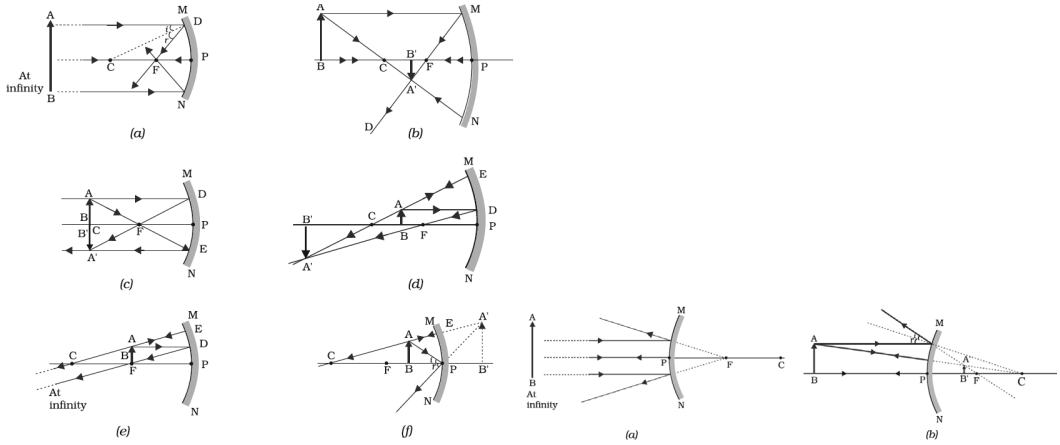
30. A student is learning about the properties of lenses and makes the following statements:
I. A concave lens is a diverging lens, which means it diverges a parallel beam of light.
II. A convex lens is a converging lens, which means it converges a parallel beam of light.
III. Both concave and convex lenses have real principal foci.
Choose from the following the correct option that lists the correct statements.
(a) I and II (b) I and III
(c) I, II and III (d) II and III

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31. A student observes the formation of a spectrum of seven colors when white light passes through a glass prism. What is the cause of this phenomenon?
(a) White light is composed of a single color which is split by the prism.
(b) Different colors of light have the same angle of refraction inside the prism.
(c) The refractive index of the prism is different for different wavelengths of light.
(d) The prism reflects the white light and produces the spectrum.

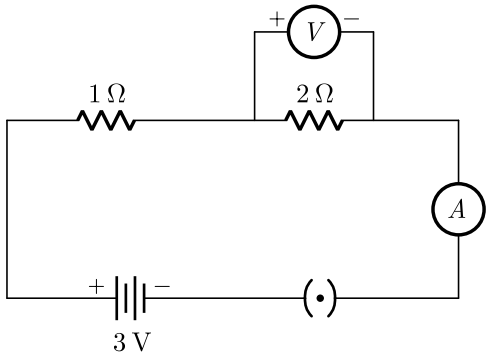
32. **Assertion (A) :** A converging lens is used as a magnifying glass.
Reason (R) : When an object is placed between the focal length and the optical center of a converging lens, it forms a virtual, erect, and magnified image.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

33. The diagram shows different types of mirrors used in daily life.



A. Name the type of mirror used in the headlights of a car.
B. Identify the mirror used in solar furnaces and explain its role.
C. State the mirror used in rear-view of vehicles and explain the reason for its preference.

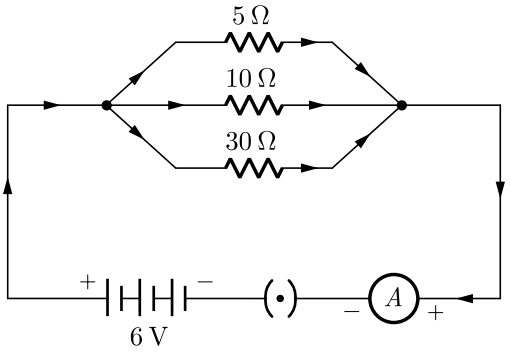
34. Attempt either option A or B
A.



Find out the following in the above electric circuit
1. Reading of the ammeter
2. Reading of the voltmeter

OR

B. For the circuit diagram given below, calculate :

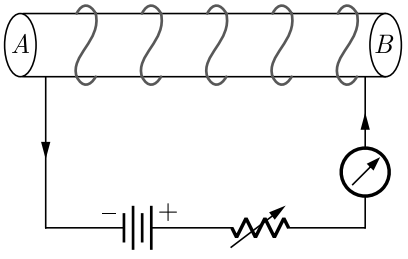


(a) the value of current through each resistor.
(b) the total current in the circuit.

35. The near point of a person suffering from hypermetropia is 75 cm. Calculate the focal length and power of the lens required to enable him to read the newspaper which is kept at 25 cm from the eye.

36. A torch bulb is rated 5.0 V and 500 mA. Calculate
(i) its power,
(ii) resistance and
(iii) energy consumed when it is lighted for four hours.

37. Diagram below shows a circuit containing a coil wound over a long and thin hollow cardboard tube. Copy the diagram.



(i) Show the polarity acquired by each face of the solenoid.
(ii) Draw the magnetic field lines of force inside the coil and also show their direction.
(iii) Mention two methods to increase the strength of the magnetic field inside the coil.

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38. Study the data given below showing the focal length of three concave mirrors A, B and C and the respective distances of objects placed in front of the mirrors:

Case	**Mirror**	**Focal Length (cm)**	**Object Distance (cm)**
1	A	20	45
2	B	15	30
3	C	30	20

(i) In which one of the above cases the mirror will form a diminished image of the object? Justify your answer.

(ii) List two properties of the image formed in case 2.
Attempt either subpart C or D.

(iii) What is the nature and size of the image formed by mirror C?
Draw ray diagram to justify your answer.

OR

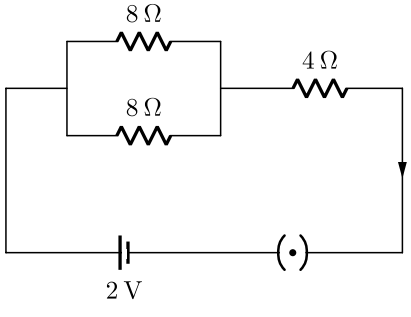
(iv) An object is placed at a distance of 18 cm from the pole of a concave mirror of focal length 12 cm. Find the position of the image formed in this case.

39. Attempt either option A or B

A. State Joules law of heating. List two special characteristics of a heating element wire.
An electric iron consumes energy at the rate of 880W when heating is at the maximum rate and 440W when the heating is at the minimum rate. The applied voltage is 220 V. Calculate the current and resistance in each case.

OR

B. Study the given electric circuit and calculate :
(i) the current flowing through the 4 Ω resister and
(ii) potential difference across the combination of two resistor of 8 Ω each.



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