



Indian School Al Wadi Al Kabir

Mid-term Examination (2026-2027)

Class: X
Date: 15/09/2026

Subject: SCIENCE (086)
Set- I

Max. Marks: 80
Time: 3 hours

General Instructions:

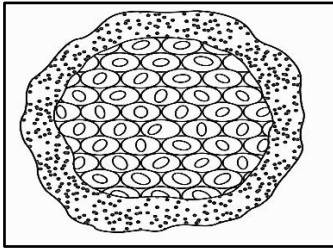
- (i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry, and Section C is Physics.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

Section – A

- 1 Which of the following statements correctly explains why diffusion alone is insufficient to meet the oxygen requirements of multicellular organisms? 1
A. Multicellular organisms do not possess respiratory organs.
B. Not all cells of multicellular organisms are in direct contact with the environment.
C. Diffusion occurs only in aquatic organisms.
D. Oxygen cannot dissolve in body fluids.
- 2 Which component of blood is mainly responsible for the transport of oxygen? 1
A. Plasma
B. Platelets
C. White blood cells
D. Red blood cells
- 3 The phloem in plants is responsible for 1
A. Transport of water.
B. Transport of food.
C. Transport of water vapour.
D. Transport of minerals.
- 4 Which plant hormone is primarily responsible for promoting cell division? 1
A. Auxin
B. Cytokinin
C. Abscissic acid
D. Ethylene
- 5 A person suddenly steps on a sharp object and immediately withdraws his foot. Which part of the nervous system is mainly responsible for this rapid response? 1
A. Cerebrum
B. Cerebellum
C. Spinal cord
D. Medulla

- 6 A feature of reproduction that is common to Amoeba, Spirogyra and yeast is that: 1
- A. they reproduce asexually
 - B. they are all unicellular
 - C. they reproduce
 - D. they are all multicellular

- 7 1



Observe the above diagram of reproduction in *Plasmodium*. A student observes that a single parent cell gives rise to a large number of daughter cells simultaneously. Which of the following conclusions can be logically drawn from this observation?

- A. The organism reproduces by binary fission because its nucleus divides before the cytoplasm.
- B. The organism reproduces by multiple fission because repeated nuclear divisions are followed by the formation of many daughter cells.
- C. The organism reproduces by budding because the daughter cells develop as small outgrowths from the parent cell.
- D. The organism reproduces by fragmentation because the parent body breaks into several independent pieces.

The following two questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

- 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.

- 8 **Assertion (A):** Reflex actions are generally faster than voluntary actions. 1
- Reason (R):** Reflex actions are coordinated mainly through the brain, reducing the time required for the response.

- 9 **Assertion (A):** DNA copying during reproduction is not always perfectly accurate. 1
- Reason (R):** Minor inaccuracies during DNA copying can produce variations in offspring.

- 10 Why is the small intestine well suited for the absorption of digested food? 2

- 11 **Students to attempt either option A or B.** 2

A.

- (i) Name the part of the brain responsible for maintaining posture and balance of the body.

- (ii) Name the part of the brain that controls involuntary actions such as heartbeat and breathing.

OR

B. Why does a plant shoot bend towards light? Name the hormone and explain the process briefly.

- 12 (i) A student observes that a filamentous organism breaks into several pieces, each of which grows into a new organism. Identify the process. 2
(ii) Name one organism in which this process commonly occurs.
- 13 (i) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide during transportation of blood in human beings and label on it: Lung capillaries, Pulmonary artery to lungs, Aorta to body. 3
(ii) What is the advantage of separate channels in mammals and birds for oxygenated and deoxygenated blood?
- 14 (i) A student suddenly sees a snake and experiences a rapid heartbeat and faster breathing. Which hormone is responsible for this response? 3
(ii) Why is this hormone useful in such a situation?
- 15 Read the passage carefully and answer the questions that follow. 4

Plants cannot move from one place to another, but they respond to changes in their surroundings. Growth movements in plants are often controlled by plant hormones. For example, a plant kept near a window grows towards the source of light. In another situation, roots grow downwards into the soil while shoots generally grow upwards.

Attempt either subpart A or B.

A. Name the plant hormone that inhibits growth and helps plants respond to stress conditions.

OR

B. What type of response is shown by roots growing towards gravity?

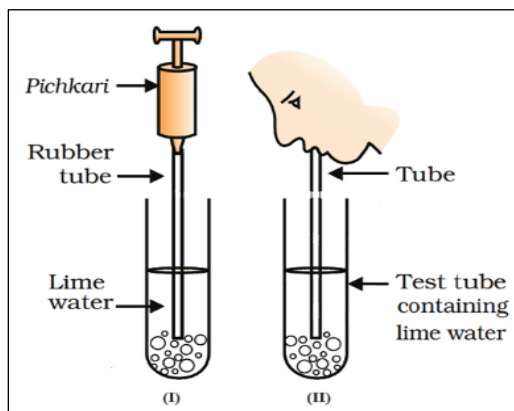
C. Which plant hormone promotes ripening of fruits in the plants?

D. How does a tendril of a pea plant grow around a support?

- 16 **Attempt either option A or B.** 5
A.
(i) Draw a labelled diagram of the human excretory system.
(ii) What are the methods used by plants to get rid of excretory products?

OR

B. Observe the given experimental set-up carefully.



In diagram (I), atmospheric air is being passed into lime water with a syringe, while in diagram (II), air is being exhaled into lime water. The time taken for the lime water to turn milky in both the test tubes is different. Explain under the following –

- Observation
- Reason
- Inference

Section – B

- 17 A student notices that white coloured silver chloride turns grey when exposed to sunlight for some time. What results in the change in colour of silver chloride? 1
- Silver chloride comes in contact with air, moisture and acids and corrodes.
 - Silver chloride decomposes to form silver
 - Silver chloride combines with oxygen
 - Silver chloride dissolves in sunlight
- 18 A metal strip is placed in a salt solution. After some time, a coating of another metal appears on the strip. This is because: 1
- A decomposition reaction has occurred.
 - The metal strip is less reactive than the metal in the salt solution.
 - The metal strip is more reactive and has displaced the other metal.
 - No chemical reaction has occurred.
- 19 When lead nitrate is heated in a test tube, we observe that: 1
- A colourless gas with no smell is evolved.
 - The white colour changes to yellow and no gas is evolved.
 - A brown coloured gas is evolved.
 - A colourless gas which turns lime water milky is evolved.
- 20 A farmer tests the pH of four soil samples and obtains values of 2, 5, 7 and 9. Which soil sample would require the greatest attention to reduce excessive acidity? 1
- Soil with pH 9
 - Soil with pH 7
 - Soil with pH 5
 - Soil with pH 2

- 21 When 2mL of sodium hydroxide is added to a few pieces of granulated zinc in a test tube and then warmed, the reaction that occurs can be written in the form of a balanced chemical equation as: 1
- A. $\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2\text{O}$
 B. $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$
 C. $2\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2$
 D. $2\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2\text{O}$
- 22 To a small amount of copper oxide in a beaker, when we add hydrochloric acid slowly with stirring, the change in the colour of the solution is due to the formation of: 1
- A. Copper(II) oxide, which is black in colour
 B. Copper(I) chloride, which is blue in colour
 C. Copper(II) chloride, which is blue-green in colour
 D. Copper(I) oxide, which is black in colour
- 23 An aqueous solution turns blue litmus red. Excess addition of which of the following solutions would reverse the change? 1
- A. Sodium hydroxide
 B. Hydrochloric acid
 C. Vinegar
 D. Nitric acid

The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

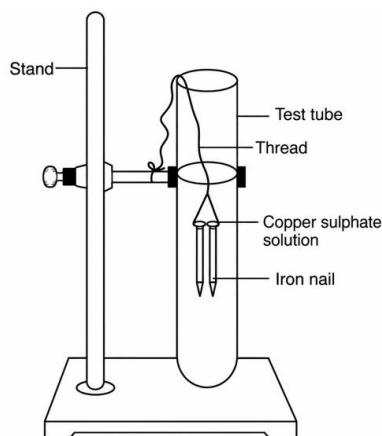
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- 24 **Assertion (A):** Washing soda is used for removing permanent hardness of water. 1
Reason (R): Washing soda is hydrated sodium carbonate.
- 25 A chemical compound X is used to bleach washed clothes in laundry as well as to make drinking water free from germs. Identify X and write its chemical formula. Write the method of its preparation in the form of a balanced chemical equation. 2
- 26 **Attempt either option A or B.** 3
- A.
- A copper wire, on burning, gets coated with a black substance.
 (a) Write the chemical equation for the reaction.
 (b) How can this chemical change be reversed? Write the chemical equation for the reaction. Identify the oxidation and reduction reactions taking place.

OR

- B.
- Study the experimental setup shown in the diagram and write a chemical equation for the reaction involved. Name and define the type of reaction. List two other metals that

can be used in place of iron to show the same type of reaction with copper sulphate solution.



- 27 (a) Define olfactory indicators. Name two substances that can be used as olfactory indicators. 3
- (b) Choose strong acids from the following:
 CH_3COOH , H_2SO_4 , H_2CO_3 , HNO_3

- 28 A teacher passes electric current through acidified water using carbon electrodes. Gases are collected in two inverted test tubes. The volume of one gas is approximately twice that of the other. 4

- Why is the volume of one gas twice that of the other?
- Name the gases collected at the anode and the cathode.
- Name the type of decomposition reaction and write the balanced chemical equation of the reaction.

OR

- Define decomposition reaction and give one example for a thermal decomposition reaction.

- 29 **Attempt either option A or B.** 5
- A. A student is given three colourless solutions P, Q and R. Their pH values are 3, 7 and 10 respectively.

- Identify the acidic, neutral and basic solutions.
- Which solution has the highest H^+ concentration?
- Which solution has the highest OH^- concentration?
- What would happen to the pH of solution P if it is diluted?
- Explain why universal indicator is more useful than a single indicator for comparing these solutions.

OR

- B.(i) Write chemical equations to show what happens when an acid reacts with a
- metal
 - base
 - metal carbonate

- (ii) A mild non-corrosive basic salt A used in cooking is heated to form B, which

removes permanent hardness from water. Identify A and B and write the chemical equation of the reaction.

Section – C

- 30 A 5 cm long rod is placed vertically in front of a concave mirror. If its 5 cm long image is formed at 20 cm in front of the mirror, the focal length of the mirror is: 1
- A. -20 cm
 - B. -10 cm
 - C. -5 cm
 - D. 20 cm

- 31 Consider the following statements in the context of the human eye: 1
- (a) The diameter of the eyeball is about 2.3 cm.
 - (b) The iris is a dark muscular diaphragm that controls the size of the pupil.
 - (c) Most of the refraction of the light rays entering the eye occurs at the crystalline lens.
 - (d) While focusing on objects at different distances, the distance between the crystalline lens and the retina is adjusted by ciliary muscles.

The correct statements are

- A. (a) and (b)
- B. (a), (b) and (c)
- C. (b), (c) and (d)
- D. (a), (c) and (d)

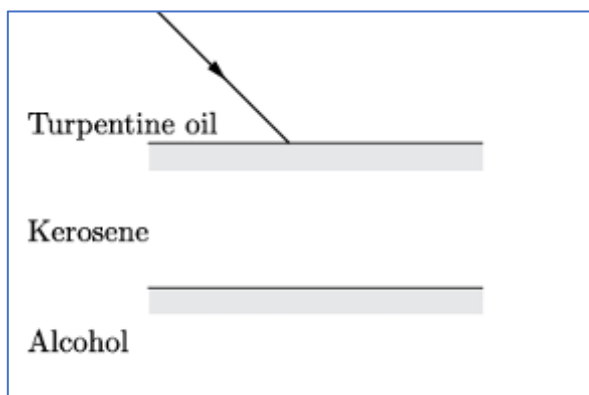
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- C. A is true, but R is false.
- D. A is false, but R is true.

- 32 **Assertion (A):** Due to scattering of sunlight, the clear sky predominantly appears blue. 1
Reason (R): The wavelength of blue light is nearly 1.8 times the wavelength of red light.

- 33 What is atmospheric refraction? Use this phenomenon to explain the natural event: 2
“Twinkling of stars”

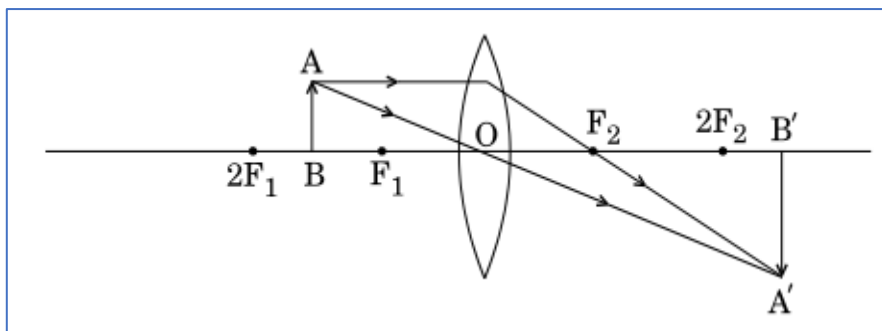
- 34 **Attempt either option A or B.** 2
- A. The refractive indices of turpentine oil, kerosene and alcohol are 1.47, 1.44 and 1.36, respectively. Based on this information, complete the following ray diagram to show the path of a ray of light through each medium.



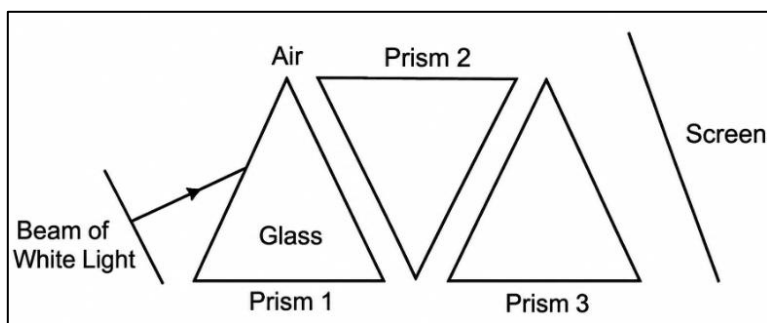
OR

B. The refractive index of medium x with respect to medium y is $2/3$, and the refractive index of medium y with respect to medium z is $4/3$. Find the refractive index of medium z with respect to medium x . If the speed of light in medium x is 3×10^8 m/s, calculate the speed of light in medium y .

- 35 A person is unable to see objects placed beyond 2 m from his eyes. 3
- Name the defect of vision the person is suffering from.
 - List two possible causes of this defect and write the type of lenses used for the correction of this defect.
 - With the help of a ray diagram, show the correction of this defect.
- 36 Study the ray diagram given below and answer the questions that follow: 3



- Is the type of lens used converging or diverging?
 - List three characteristics of the image formed.
 - In which position of the object will the magnification be -1 ?
- 37 (i) What is meant by the power of a lens? Write its SI unit. 3
- (ii) A student uses a lens of focal length 40 cm and another of -20 cm. Write the nature and power of each lens.
- 38 A group of Class X students conducted an experiment using the arrangement shown in the diagram. A narrow beam of white light was allowed to pass through Prism 1. The light then passed through an inverted Prism 2 and finally through Prism 3 before reaching a screen. The students observed changes in the path and nature of the light at different stages. 4



- A. What phenomenon occurs when white light passes through Prism 1? Explain the cause of this phenomenon.
 B. What colour(s) will be seen on the screen?

Attempt either subpart C or D.

- C. Study the given arrangement of prisms. Copy the diagram and complete the path of the light rays by showing what happens to the beam of white light as it passes through Prism 1, Prism 2 and Prism 3 and finally falls on the screen.

OR

- D. A student sets up the prism arrangement shown in the figure. He observes that after passing through Prism 2, the light appears white again, but after passing through Prism 3, a spectrum is obtained on the screen.

(i) Why is Prism 2 placed in the inverted position with respect to Prism 1?

A student replaces Prism 2 with an identical prism placed in the same orientation as Prism 1. (ii) Predict how the observation on the screen would change.

39 **Attempt either option A or B.**

5

- A. Analyse the following observation table showing a variation of image distance (v) with object distance (u) in the case of a convex lens and answer the questions that follow without doing any calculations:

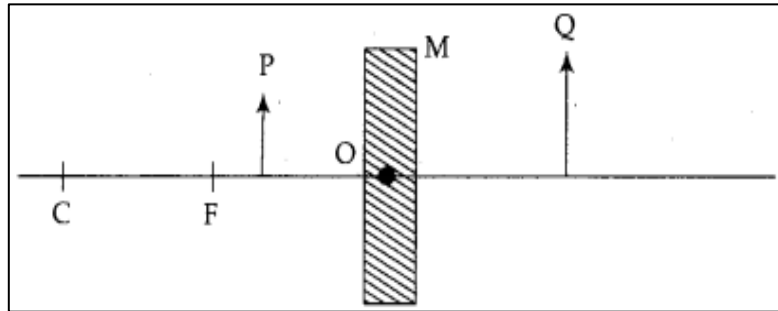
S. No.	Object-Distance u (cm)	Image-Distance v (cm)
1	– 100	+ 25
2	– 60	+ 30
3	– 40	+ 40
4	– 30	+ 60
5	– 25	+ 100
6	– 15	+ 120

- (i) What is the focal length of the convex lens? Give a reason to justify your answer.
 (ii) Write the serial number of the observation which is not correct. On what basis have you arrived at this conclusion?

- (iii) Select an appropriate scale and draw a ray diagram for the observation at S.No.2.
Also, find the approximate value of magnification.

OR

- B. (i) Define the following terms in the context of spherical mirrors:
a. Pole
b. Centre of curvature
(ii) Draw ray diagrams to show the principal focus of a:
a. Concave mirror
b. Convex mirror
(iii) Consider the following diagram in which M is a mirror, and P is an object, and Q is its magnified image formed by the mirror.



State the type of the mirror M and one characteristic property of the image Q.

All the Best