



INDIAN SCHOOL SOHAR
PERIODIC TEST II 2024-25
SCIENCE

No. of printed pages: 9

CLASS: X

MAX MARKS: 80

DATE: 24/09/2024

TIME: 3 HOURS

General Instructions:

Read the following instructions very carefully and strictly follow them:

- (i) This question paper comprises 39 questions. All questions are compulsory.
- (ii) This question paper is divided into five sections – A, B, C, D and E.
- (iii) Section A – Questions No. 1 to 20 are Multiple Choice Questions. Each question carries 1 mark.
- (iv) Section B – Questions No. 21 to 26 are Very Short Answer type questions. Each question carries 2 marks. Answer to these questions should be in the range of 30 to 50 words.
- (v) Section C – Questions No. 27 to 33 are Short Answer type questions. Each question carries 3 marks. Answer to these questions should be in the range of 50 to 80 words.
- (vi) Section D – Questions No. 34 to 36 are Long Answer type questions. Each question carries 5 marks. Answer to these questions should be in the range of 80 to 120 words.
- (vii) Section E – Questions No. 37 to 39 are of 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
- (viii) There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.

SECTION A

Select and write the most appropriate option out of the four options given for each of the questions no. 1 to 20.

1. Which of the following gases can be used for storage of fresh sample of an oil for a long time? 1
(a) Carbon dioxide or Oxygen (b) Carbon dioxide or Helium
(c) Nitrogen or Oxygen (d) Helium or Nitrogen
2. Oxygen gas reacted with hydrogen to produce water. This reaction is represented by the equation $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$. The above reaction is example of 1
1. Oxidation of hydrogen
2. Reduction of oxygen
3. Reduction of hydrogen
4. Redox reaction
(a) 1,2,3 (b) 2,3,4
(c) 1,3,4 (d) 1,2,4
3. Which of the following processes is used to obtain aluminium from aluminium oxide? 1
(a) Calcination (b) Roasting
(c) Carbon reduction (d) Electrolytic reduction
4. Chemically rust is 1
(a) Hydrated ferrous oxide (b) Ferric oxide
(c) Hydrated ferric oxide (d) Ferric hydroxide

5. Consider the following statement and choose the incorrect one: 1
- (a) Pure water is neutral, the concentrations of hydrogen ions and hydroxide ions are equal.
 - (b) Acidic solutions have excess of hydrogen ions.
 - (c) The basic solutions have excess of hydroxide ions.
 - (d) A solution having a high concentration of hydrogen ions has a high pH value.

6. Sodium Carbonate is a product of 1
- (a) Strong acid and strong base
 - (b) Strong acid and weak base
 - (c) Strong base and weak acid
 - (d) Weak acid and weak base

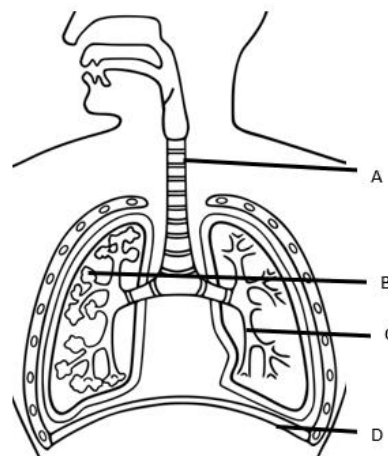
7. pH of different solutions is given in the table below: 1

Solution	pH
P	2.2-2.4
Q	13.8-14.0
R	6.5-7.5
S	8.0-9.0

Arrange these solutions in the increasing order of H^+ ion concentration.

- (a) $S < R < Q < P$
 - (b) $P < R < S < Q$
 - (c) $R < S < Q < P$
 - (d) $Q < S < R < P$
8. The part of brain that controls intellectual ability is: 1
- (a) Cerebrum
 - (b) Cerebellum
 - (c) Medulla
 - (d) Spinal cord
9. In humans, the blood vessel that normally carries large amount of urea is: 1
- (a) Vena cava
 - (b) Renal vein
 - (c) Renal artery
 - (d) Pulmonary veins
10. The heart rate increases at the time of stress due to the: 1
- (a) Increased secretion of thyroxine
 - (b) Increased production of adrenalin
 - (c) Reflex action
 - (d) Increased secretion of enzymes
11. The diagram represents the human respiratory system. Choose the correct labelling from the options given: 1

- (a) A- Trachea, B-Bronchiole, C- Alveoli, D-Diaphragm
- (b) A- Trachea, B-Alveolus, C- Bronchiole, D-Diaphragm
- (c) A- Larynx, B-Bronchiole, C- Alveoli, D- Rib cage
- (d) A- Larynx, B- Alveolus, C- Bronchiole, D-Diaphragm



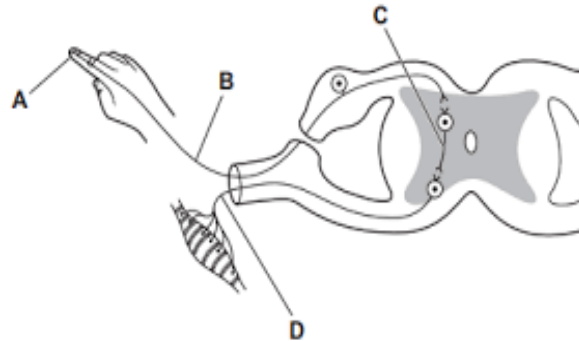
12. In Rhizopus, tubular thread-like structures bearing sporangia at their tips are called: 1
- (a) filaments
 - (b) hyphae
 - (c) rhizoids
 - (d) roots
13. The image formed by a concave mirror of focal length 50 cm is real and of magnification – 1. The distance between the pole and the centre of curvature is 1
- (a) 50 cm
 - (b) 100 cm
 - (c) 200 cm
 - (d) 0 cm

14. A wire has a certain electrical resistance. The diameter and length of the wire may be changed. Which pair of changes **must** cause the resistance of the wire to increase?

	change of diameter	change of length
(a)	decrease	decrease
(b)	decrease	increase
(c)	increase	decrease
(d)	increase	increase

1

15. The following is the scheme showing components of a reflex arc. Identify the components A, B, C and D.



- (a) Effector, B-Motor neuron, C-Spinal cord, D-Sensory neuron
 (b) Effector, B-Sensory neuron, C-Spinal cord, D-Motor neuron
 (c) Receptor, B-Motor neuron, C-Relay neuron, D-Sensory neuron
 (d) Receptor, B-Sensory neuron, C-Relay neuron, D-Motor neuron

1

16. Which among the given statements is not an advantage of asexual reproduction?

- (a) Energy requirement is less.
 (b) Offsprings produced asexually are new species.
 (c) Helps in conserving genetic material
 (d) Number of offsprings produced is more.

1

For Questions number **17 to 20**, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

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

17. Assertion (A): Transmission of nerve impulse across a synapse is accomplished by neurotransmitters.

Reason(R): Impulse transmission through a synapse is unidirectional.

1

18. Assertion (A): Normal urine of humans is hypertonic compared to blood flowing through veins.
 Reason(R): Capillaries bring in impure blood to kidneys.

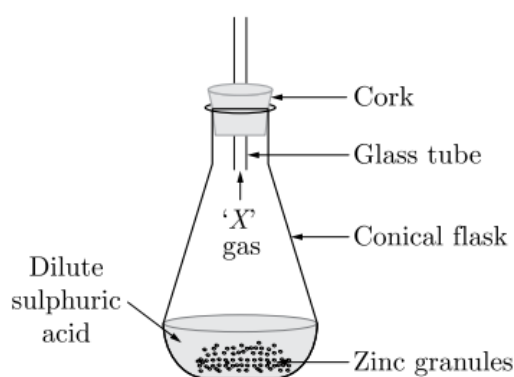
1

19. Assertion (A): Sunlight reaches us without dispersion in the form of white light and not as its components.
Reason (R): Dispersion takes place due to variation of refractive index for different wavelength but in vacuum the speed of light is independent of wavelength and hence vacuum is a non-dispersive medium. 1
20. Assertion (A): Silver bromide is stored in dark coloured bottles in laboratories.
Reason (R): Silver bromide undergoes photochemical decomposition in the presence of sunlight. 1

SECTION B

Questions no. **21 to 26** are very short answer type questions.

21. Observe the given figure and answer the questions that follow



- (i) Identify the gas X
(ii) Write the chemical reaction involved.
(iii) Which type of chemical reaction is taking place? 2
(iv) Is it an exothermic reaction or endothermic reaction?
22. With the help of neat labelled diagrams explain the most common method of asexual reproduction in hydra. 2
23. The nutritive strategies are different in leech and mushrooms. Justify this statement. 2
24. Differentiate between olfactory receptors and gustatory receptors.

OR

State any two differences between growth dependent and growth independent movements in plants. 2

25. (a) Draw a labelled ray diagram to show the formation of an image of an object by a convex mirror. Mark clearly the pole, focus, and centre of curvature on the diagram.
(b) What happens to the image when the object is moved away from the mirror gradually? 2
26. Name the muscles present in the human eye which enable it to focus on objects at varied distances (i.e., distant as well as nearby objects). Explain how it happens.

OR

Draw a ray diagram to show the formation of a rainbow in the sky. Mark on the diagram three points A, B and C as given below:

- A – where dispersion of light occurs
 B – where internal reflection of dispersed light occurs
 C – where refraction of dispersed light occurs

2

SECTION C

Questions no. 27 to 33 are short answer type questions.

27. A water soluble compound 'X' of sodium on reacting with dilute H_2SO_4 released a colorless and odourless gas accompanied by brisk effervescence. When the gas was passed through water, the solution obtained turned blue litmus solution red. On bubbling the gas through lime water, it initially became milky and the milkiness disappeared when the gas was passed in excess. Identify the substance 'X' and write the chemical equation for the reactions involved. 3
28. Give reason for the following:
- (i) Hydrogen gas is not evolved when most of the metals react with nitric acid.
 - (ii) calcium start floating in water.
 - (iii) Aluminium is a reactive metal but is still used for packing food articles

OR

The thermite process is used for repairing railway tracks on site

- A. Write the balanced equation for the reaction taking place in this process, mentioning the physical state of reactants and products 3
 - B. What information in the chemical reaction indicates that the reaction is exothermic?
29. Give reason:
- (a) Cytokinins are found in germinating seeds.
 - (b) Insulin injections are given to diabetic patients.
 - (c) Iodine is highly essential to provide the best balance for growth. 3
30. (a) What is DNA copying?
 (b) How does DNA copying lead to cell division?
 (c) Cells formed by division are similar but not identical. Why? 3
31. A lens forms an image of an object. The object is 16.0 cm from the lens. The image is 12.0 cm from the lens on the same side as the object.
- (a) What is the focal length of the lens? Is the lens converging or diverging?
 - (b) If the object is 8.0 mm tall, how tall is the image?
 - (c) Draw a ray diagram.

OR

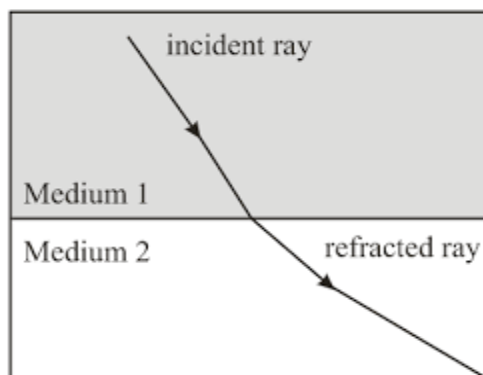
Make a diagram to show how hypermetropia is corrected. The near point of a hypermetropic eye is 1 m. What is the power of lens required to correct this defect? Assume that near point of normal eye is 25 cm. 3

32. The table below shows the refractive index of different materials.

	Water	Kerosene	Flint glass	Diamond
Refractive index of the material	1.33	1.44	1.65	2.42

The formula for calculating the refractive index (n_m) of a material is,

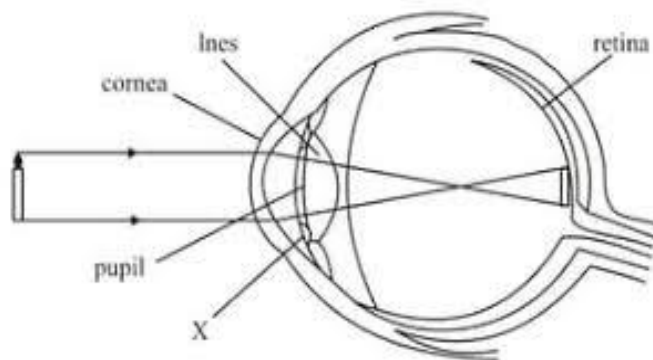
$$n_m = \frac{\text{Speed of light in } X}{\text{Speed of light in the medium}}$$



- What does X stand for?
- State the laws of refraction.
- Write all possible combinations that could be medium 1 and medium 2 from the above table with regard to refraction of light shown here.

3

33. (i) The diagram shows how a human eye sees a candle.



- What is X?
 - Which part of the eye produces maximum refraction of light rays?
 - What type of image is formed on the retina?
 - What would the size of the image (candle) formed on the retina depend on?
- (ii) What is meant by power of accommodation of the eye?

3

SECTION D

Questions no. 34 to 36 are long answer type questions.

34. I. i) In the formation of a compound between two atoms **A** and **B**, **A** loses two electrons and **B** gains one electron.
- What is the nature of the bond between A and B?
 - Suggest the compound formula formed between A and B.
- ii) Which of the following elements are metals?
- ${}_{12}\text{X}^{24}$
 - ${}_{9}\text{Y}^{19}$
 - ${}_{15}\text{Z}^{31}$
- iii) Common salt conducts electricity only in the molten state. Why?
- II. Give the composition of brass and solder alloy.

III. What happens when (write the balanced equation involved)

- a) Cinnabar is heated in air?
- b) Aluminium oxide reacts with sodium hydroxide.

OR

- I. An ore on treatment with dilute hydrochloric acid produces brisk effervescence.
 - a) Name the type of ore with one example.
 - b) What steps will be required to obtain metal from the enriched ore?
 - c) Write the chemical equations for the reactions involved in the process.
- II. When the copper wire is left in silver nitrate solution, It is observed that the solution turns bluish-green.
 - a) Explain the observation
 - b) Write the balanced chemical equation to represent the change taking place.

5

35. (a) Show the complete pathways of respiration that leads to the formation of:
- i) Carbon dioxide and water
 - ii) Ethyl alcohol
- (b) State any two features of alveoli which help in effective exchange of gases.

OR

- A. Name the parts of brain that control the following actions:
- (i) Writing fastly
 - (ii) Differentiating colours of rainbow
 - (iii) Secretion of saliva
 - (iv) Running
- B. Briefly explain peripheral nervous system and state its significance.

5

36. (i) The table gives the resistivities of five different materials:
Which one of the following is the best material for making connecting wires? Why?

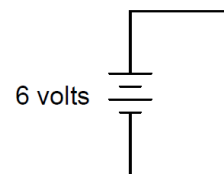
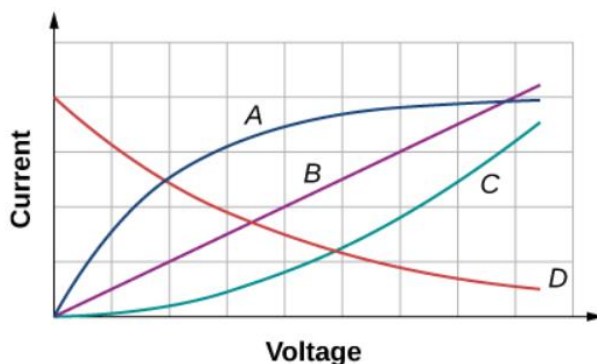
Material	Resistivity/ $\Omega \text{ m}$
Copper	1.8×10^{-8}
Iron	1.2×10^{-7}
Carbon	1.4×10^{-5}
Silicon	2.3×10^3
Glass	1.0×10^{12}

- (ii) A student needs to make a 0.14Ω resistor. She has some copper wire of diameter 0.72 mm .
Calculate the length of wire she needs for the 0.14Ω resistor. (use $\pi = \frac{22}{7}$)
- (iii) State how would electrical resistivity be affected if the wire is stretched so that its length is doubled. Justify your answer.

OR

- (a) State Ohm's law.
- (b) Electric current is measured in the unit of the ampere. What is the physical definition for this unit?
- (c) What fundamental quantities constitute 1 ampere of electric current?

- (d) Shown below are the results of an experiment where four devices were connected across a variable voltage source. The voltage is increased and the current is measured. Which device, if any, is an ohmic device? Explain?



- (e) What would happen if a wire having no resistance at all ($0\ \Omega$) were connected directly across the terminals of a 6-volt battery? How much current would result, according to Ohm's Law?

5

SECTION E

The following questions are source-based/case-based questions. Read the case carefully and answer the questions that follow.

37. When a ray of light moving in a medium enters obliquely into another medium, it bends from its path. This phenomenon is called refraction of light. The ability of a medium to refract light is also expressed in terms of optical density. It is not the same as mass density. A ray of light travelling from a rarer medium to a denser medium slows down and bends towards the normal. 1
- (a) Can the absolute refractive index of a medium be less than one? Justify? 1
- (b) Absolute refractive indices of water and glass are $\frac{4}{3}$ and $\frac{3}{2}$ respectively.
- (i) In which one of the two media is the speed of light more?
- (ii) If a ray of light enters obliquely from glass to water, will it bend towards the normal or away from the normal?
- (c) If the speed of light in glass is $2 \times 10^8\ m/s$, find the speed of light in (i) water and (ii) vacuum.

OR

2

Why does a light ray incident on a rectangular glass slab immersed in any medium emerges parallel to itself? Draw a labelled diagram to justify this statement.

38. Layering is an artificial method of vegetative propagation in which a stem attached to the plant is bent and covered with soil. After sometime, roots will appear from the buried part and thus new plants are formed. Young stems that can be bent easily without any breakage are preferred for this method. Jasmine and bougainvillea (paper flower) are propagated this way.
- (a) Layering is not used for propagating plants like sugarcane or mango. Why? 1
- (b) Why is plant like jasmine propagated only using this method? 1
- (c) State any two advantages of artificial vegetative propagation.

OR

2

State any two features of vegetative propagation that makes it an asexual method of reproduction.

39. The metal sodium reacts with air and water. A student reacted sodium with water and measured the volume of gas at intervals of 30 seconds. The results are shown below:

Time/s	0	30	60	90
Volume/ cm ³	40	40	60	74

- (a) Name the gas liberated in the above reaction. Write the reaction involved. 1
(b) How will you test this gas? 1
(c) What will be the colour of universal indicator when added to the solution formed? What does it show?

OR

2

- (i) What will be the colour of phenolphthalein in the solution formed?
(ii) Which ion is responsible for the basic nature of NaOH?
