

Ballan

Roll No. 16241

No. of Printed Pages : 10

MG-260+170=430

HALF YEARLY EXAMINATION 2024-25

SCIENCE

Time : 3 hrs.]

Class X

[M.M. : 80

General Instructions—

- (i) This question paper consists of 39 questions. All questions are compulsory.
- (ii) This question paper is divided into five sections - A, B, C, D and E.
- (iii) Section A - Question Nos. 1 to 20 are Multiple Choice Questions. Each question carries 1 mark.
- (iv) Section B - Question Nos. 21 to 26 are Very Short Answer (VSA) type questions. Each question carries 2 marks.
- (v) Section C - Question Nos. 27 to 33 are Short Answer (SA) type questions. Each question carries 3 marks.
- (vi) Section D - Question Nos. 34 to 36 are Long Answer (LA) type questions. Each question carries 5 marks.
- (vii) Section E - Question Nos. 37 to 39 are source based / case based units of assessment carrying 4 marks.
- (viii) There is no overall choice. However, an internal choice has been provided in some sections.

SECTION-A

1. An aqueous solution of a salt shows an orange red colour when a drop of universal indicator is added to it. This salt is made up of :

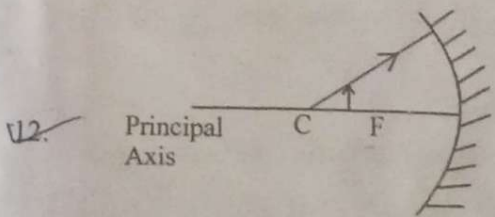
- (a) A strong acid and a strong base (b) A weak acid and a weak base
(c) A strong acid and a weak base (d) A weak acid and a strong base

2. Identify the correct representation of reaction occurring during chloro alkali process :

P. T. O.

3. The pair (s) which will show displacement reaction is/are :
- (a) $2\text{NaCl}(l) + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(l) + \text{Cl}_2(g) + \text{H}_2(g)$
 (b) $2\text{NaCl} + 2\text{H}_2\text{O}(aq) \rightarrow 2\text{NaOH}(aq) + \text{Cl}_2(g) + \text{H}_2(g)$
 (c) $2\text{NaCl} + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(aq) + \text{Cl}_2(aq) + \text{H}_2(aq)$
 (d) $2\text{NaCl} + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(aq) + \text{Cl}_2(g) + \text{H}_2(g)$
- (i) NaCl solution and Copper metal
 (ii) AgNO_3 solution and Copper metal
 (iii) $\text{Al}_2(\text{SO}_4)_3$ solution and Magnesium metal
 (iv) ZnSO_4 solution and Iron metal
- (a) (ii) only
 (b) (ii) and (iii)
 (c) (iii) and (iv)
 (d) (i) and (ii)
4. When lead nitrate powder is heated in a boiling tube, we observe :
- (a) Brown fumes of nitrogen dioxide
 (b) Brown fumes of Lead oxide
 (c) Yellow fumes of nitrogen dioxide
 (d) Brown fumes of nitric oxide
5. Which of the following statements about the reaction given below are correct?
- $$\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$$
- (i) HCl is oxidised to Cl_2
 (ii) MnO_2 is reduced to MnCl_2
 (iii) MnCl_2 acts as an oxidising agent
 (iv) HCl acts as an oxidising agent
- (a) (ii), (iii) and (iv)
 (b) (i), (ii) and (iii)
 (c) (i) and (ii) only
 (d) (iii) and (iv) only
6. Calcium oxide reacts vigorously with water to produce slaked lime.
- $$\text{CaO}(s) + \text{H}_2\text{O}(l) \rightarrow \text{Ca}(\text{OH})_2(aq)$$
- This reaction can be classified as :
- (A) Combination reaction
 (B) Exothermic reaction
 (C) Endothermic reaction
 (D) Oxidation reaction
- Which of the following is a correct option ?

- (a) (A) and (B)
 (b) (C) and (D)
 (c) (A), (C) and (D)
 (d) (A) and (D)
7. Name the circulatory fluid in the human body other than blood—
- (a) Platelets
 (b) RBC
 (c) Lymph
 (d) Plasma
8. Any change in environment to which an organism responds is called :
- (a) Stimulus
 (b) Coordination
 (c) Response
 (d) Hormone
9. Which nerves transmits impulses from the central nervous system towards muscles cells ?
- (a) Sensory nerves
 (b) Motor nerves
 (c) Relay nerves
 (d) Cranial nerves
10. Breathing is controlled by which part of the brain ?
- (a) Cerebrum
 (b) Cerebellum
 (c) Hypothalamus
 (d) Medulla oblongata
11. The longest fibre on the cell body of a neuron is called :
- (a) sheath
 (b) cytoplasm
 (c) axon
 (d) dendrites



- While looking at the above diagram Nalini concluded that—
- (i) Image of the object will be virtual.
 (ii) The reflected ray will travel along the same path as incident ray but in opposite direction.

(iii) The image of the object will be inverted.

(iv) The mirror is a concave mirror hence focal length will be negative.

Which of the following statements are correct ?

(a) (i) and (ii)

(b) (i) and (iii)

(c) (ii), (iii) and (iv)

(d) All of the above

13. An incident ray of light enters from air into glass and bends towards the normal. Which of the following statement is true ?

(a) Air is denser and glass is rarer.

(b) Refractive index of air is more than that of glass

(c) Optical density of glass is more than air.

(d) Both air and glass have same optical density

14. Magnification produced by a concave mirror is +2. What is the nature of the image formed ?

(a) Real, Inverted, diminished

(b) Virtual erect, diminished

(c) Real, Inverted Enlarged

(d) Virtual erect and Enlarged

15. The far point of eye of the person is 2m. The type of lens needed in the spectacles to increase the far point to infinity is :

(a) Concave lens

(b) Convex lens

(c) Bi focal lens

(d) Cylindrical lens

16. Twinkling of stars is due to :

(a) Dispersion of light by water droplets

(b) Refraction of light by different layers of different optical density

(c) Scattering of light by dust particles

(d) Internal reflection of light by clouds

Q.17 to Q.20 consists of two statements Assertion (A) and Reason (R). Answer these questions 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.

17. Assertion (A) : Silver bromide decomposition is used in black and white photography.

Reason (R) : Light provides energy for this exothermic reaction.

18. Assertion (A) : Molecular movements are needed for life.

Reason (R) : Body structures made up of these molecules need continuous repair and maintenance.

19. Assertion (A) : A receptor is a specialised group of cells in a sense organ that perceive a particular type of stimulus.

Reason (R) : Different sense organs have different receptors for detecting stimuli.

20. Assertion (A) : Sky appears blue in colour during day time.

Reason (R) : White light is composed of seven colours.

SECTION-B

2 × 6 = 12

21. (a) How does the flow of acid rain into the river makes the survival of aquatic life difficult ?

(b) Arrange the following in an increasing order of their pH values :
NaOH solution, Gastric juice, Lemon juice, Blood, Lactic acid

OR

Give reasons :

(a) Dry HCl gas does not change the colour of dry litmus paper.

(b) Antacids are used to treat indigestion.

22. What are Enzymes ? Name any one enzyme of our digestive system and write its function.

23. How is oxygen and carbon dioxide are transported in human beings?

24. The number of malaria patients increased tremendously when the large number of frogs were exported from village. What could be the cause for it ? Explain with the help of food chain.

25. Draw the ray diagram to show refraction of light through glass prism and label the following angles—
- Angle of Incidence
 - Angle of Emergence
 - Angle of deviation

OR

- What is meant by dispersion of light?
 - Draw a diagram to show dispersion of light through glass prism.
26. Name one gustatory receptor and one olfactory receptor in human beings.

OR

How is brain protected from injury and shock?

3×7=21

SECTION-C

27. A compound X, on heating at 373 K loses water molecules and forms Y. Y is a substance which doctors use for supporting fractured bones in the right position.
- Identify X and Y.
 - Support your answer with a suitable balanced equation.
 - Can we obtain X from Y? Give reason for your answer.
28. When Potassium Iodide solution is added to a solution of lead (II) Nitrate in a test tube, a precipitate is formed.
- Write a balanced chemical equation for this reaction.
 - Name the precipitate formed and its colour.
 - What type of reaction can this be categorised into?

OR

Write one equation each for the decomposition reactions where energy is supplied in the form of heat, light and electricity each.

29. During electrolysis of brine, a gas 'A' is liberated at anode. When gas A is passed through slaked lime, a compound B is formed which is used for disinfecting drinking water.
- Identify 'A' and 'B'.

- Write a balanced equation for the formation of B from A.
- What is the common name for the compound 'B'? Also write its chemical name.

30. A student wants to project the image of an object on the screen.

- Which type of lens should be used? *convex*
- At what distance in terms of focal length of lens should be placed the object so as to get.
 - Magnified image
 - Diminished image

Draw the ray diagram to show the formation of image in the first case.

31. (a) Draw the ray diagram to show refraction of light through glass slab.
 (b) The speed of light in air is 3×10^8 m/sec and that in medium A is 1.5×10^8 m/sec. What will be the refractive index of medium A.

OR

- Draw the ray diagram to show the image formation in a concave mirror when object is placed between F and C.
- The magnification of spherical mirror is +0.5. What is the type of mirror and nature of image formed?

32. (a) Explain with diagram the process of formation of rainbow in the sky.
 (b) Why are danger signals red in colour?

33. Explain the following terms and its impact—

- Food Web
- Ozone depletion
- Biological magnification.

OR

- (a) In the following food chain, plants provide 500 J of energy to rats. How much energy will be available to hawks from snakes?
 Plants → Rats → Snakes → Hawks

(b) It is desirable to have two separate dustbins for discarding off household waste, one for biodegradable and another for non-biodegradable. Justify this statement suggesting the proper way of disposal of these wastes.

SECTION-D

Washing soda and baking soda are the two commonly used salts in various industries.

(a) Write the chemical name and formula of both the salts.

(b) Give two important uses of each.

(c) What happens when baking soda is heated? Give the balanced chemical equation.

OR

(a) What are olfactory indicators? Give two examples. How do acids and bases behave with olfactory indicators?

(b) You are provided with two solutions A and B. A is acidic while B is basic. State the change in the colour of solution A and B with blue litmus.

35 (a) Draw the cross section of the leaf and label the following parts—
Upper Epidermis, Chloroplast, Vascular bundle, Xylem, Phloem

(b) Write the chemical equation involved in photosynthesis.

(c) How is unused energy stored in plants?

(d) What is site for photosynthesis?

OR

(a) Draw a diagram to show human Alimentary canal and label on it the following gall bladder, stomach, ~~pancreas~~ ^{small} intestine the longest part of Alimentary canal.

(b) Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

36 (a) Draw the ray diagram to show the image formed by convex mirror when object is placed in front of it.

(b) A convex mirror is used as a rear view mirror in vehicles. Why?

(c) An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position and nature of the image.

OR

(a) Draw the ray diagram to show image formation in a concave mirror when object is placed at centre of curvature.

(b) Concave mirrors are used in solar furnaces why?

(c) An object 10 cm in size is placed at a distance of 100 cm from a concave mirror. If its image is formed at the same point where the object is placed. Calculate the focal length of the mirror and magnification of the image formed.

SECTION-E

4 x 3 = 12

37. During a chemical reaction, atoms of one element do not change into those of other element nor do atoms disappear. Actually chemical reactions involve breaking and making bonds between atoms to produce new substances. In some chemical reactions heat is produced along with the formation of products. However in some chemical reaction heat is absorbed from the surroundings.

(a) What is an exothermic reaction? Give an example of exothermic reaction with the help of balanced equation.

(b) What is an endothermic reaction? Give an example of endothermic reaction with the help of balanced equation.

(c) Why is respiration considered as an exothermic reaction? Explain. Also write a balanced chemical equation.

OR

(c) Which law supports the statement that atoms do not disappear in a chemical reaction? Define it.

38. The human eye has a converging lens system that produces an image just like a camera. When the object viewed by the lens is not clear than the person is suffering from defects of vision. In these defects the image of distant or near by object not formed on the screen of the eye but either in front of it or behind it.