



ANANDALAYA
PERIODIC TEST – 2
Class: X

Subject: Science (086)
Date : 25-09-2024

MM : 80
Time: 3 hours.

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
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.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION A

1. Which of the given options correctly represents the parent acid and base of Calcium Carbonate? (1)

OPTION	PARENT ACID	PARENT BASE
(A)	HCl	NaOH
(B)	H ₂ CO ₃	Ca(OH) ₂
(C)	H ₃ PO ₃	CaSO ₄
(D)	H ₂ SO ₄	CaSO ₄

2. The chemical reaction between copper and oxygen can be categorized as _____. (1)
(A) Displacement reaction (B) Decomposition reaction
(C) Combination reaction. (D) Double displacement reaction

3. On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution: (1)
(A) turns blue, and a grey substance is deposited on the copper coin.
(B) turns colourless and a grey substance is deposited on the copper coin.
(C) turns colourless and a reddish-brown substance is deposited on the copper coin.
(D) remains green with no change in the copper coin.

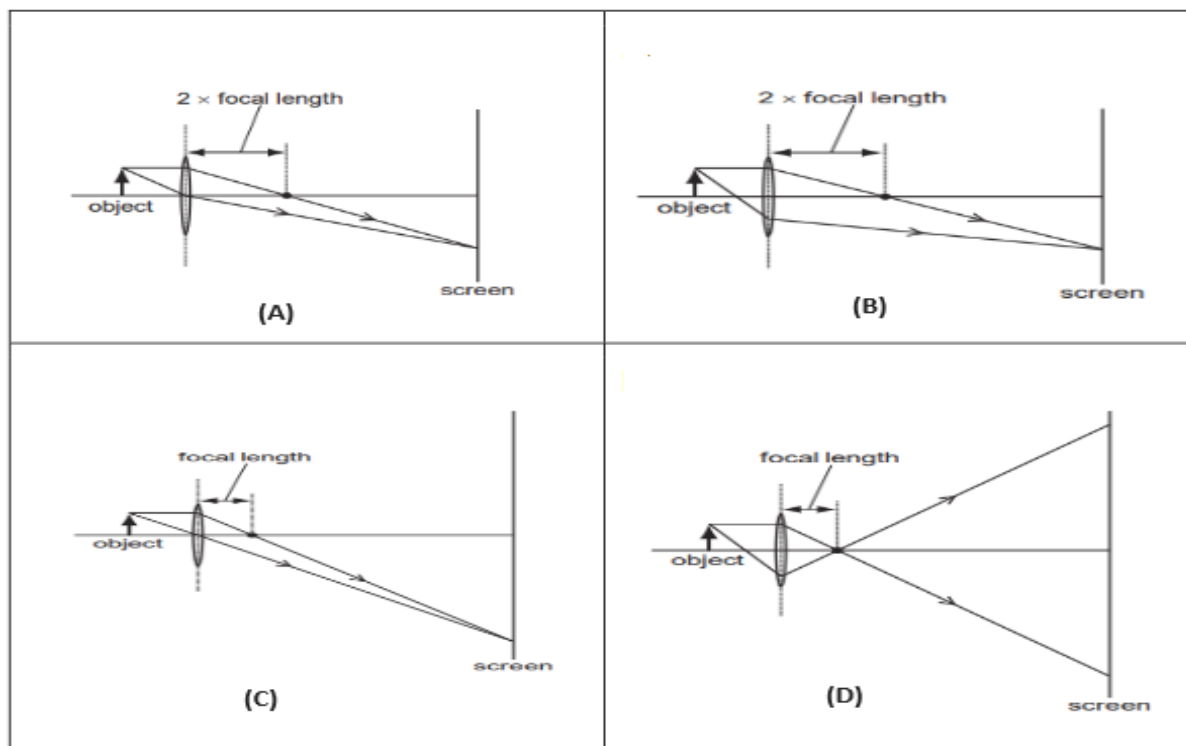
4. If 10 mL of H₂SO₄ is mixed with 10 mL of Mg(OH)₂ of the same concentration, the resultant solution will give the following colour with a universal indicator. (1)
(A) Red (B) Yellow (C) Green (D) Blue

5. In the reaction of iron with copper sulphate solution: (1)
CuSO₄ + Fe → Cu + FeSO₄ Which option in the given table correctly represents the substance oxidised and the reducing agent?

OPTION	Substance Oxidized	Substance Reduced
(A)	Fe	Fe
(B)	Fe	FeSO ₄
(C)	Cu	Fe
(D)	Cu SO ₄	Fe

6. Adding which of the following to a colourless solution would give an indication that the solution could possibly be hydrochloric acid? (1)
 (A) Copper metal strips (B) Silver metal strips
 (C) Calcium carbonate (D) Sodium Chloride
7. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. the role of calcium chloride taken in the guard tube is to _____. (1)
 (A) absorb the evolved gas (B) moisten the gas
 (C) absorb Cl^- ions from the gas (D) absorb moisture from the gas.
8. Which set of secretions is released in the small intestine of humans? (1)
 (A) Bile juice, Pancreatic, juice and Saliva
 (B) Bile juice, Pancreatic juice, Succus entericus
 (C) Gastric juice, Bile juice, Pancreatic juice
 (D) Saliva, Gastric juice, Bile juice
9. What are the products obtained by anaerobic respiration in microorganisms? (1)
 (A) Lactic acid + Carbon dioxide + Energy (B) Carbon dioxide + Water + Energy
 (C) Ethanol + Carbon dioxide + Energy (D) Pyruvate + Carbon dioxide + Energy
10. A plant gets rid of excess water through transpiration. Which is the method used by plants to get rid of solid waste products? (1)
 (A) Shortening of stem (B) Dropping down of fruits
 (C) Shedding of yellow leaves (D) Expansion of roots into the soil
11. Photosynthesis converts energy X into energy Y. What are X and Y? (1)
 (A) X is Solar energy and Y is Electrical energy
 (B) X is Chemical energy and Y is Electrical energy
 (C) X is Solar energy and Y is Chemical energy
 (D) X is Solar energy and Y is Food energy
12. Which of the following statements are true about the human heart? (1)
 (A) It is a hollow muscular organ.
 (B) It is four chambered having three auricles and one ventricle.
 (C) It pumps O_2 rich blood to body parts through the aorta.
 (D) It receives CO_2 rich blood through the vena cava.
13. Urine formation occurs through _____. (1)
 (A) Secretion, osmosis, ultrafiltration and reabsorption
 (B) Secretion, ultrafiltration and reabsorption
 (C) Only filtration and absorption
 (D) Only osmosis and secretion
14. In a synapse, the nerve impulse is transmitted from _____. (1)
 (A) dendritic end of one neuron to the axonal end of an adjacent neuron
 (B) axon of one neuron to the cyton of an adjacent neuron
 (C) cell body to the axonal end of the same neuron
 (D) axonal end of one neuron to the dendritic end of an adjacent neuron
15. An object is placed in front of a convex mirror. Its image is formed _____. (1)
 (A) at a distance equal to the object distance in front of the mirror.
 (B) at twice the distance of the object in front of the mirror.
 (C) half the distance of the object in front of the mirror.
 (D) behind the mirror and its position varies according to the object distance.

- 16 Which diagram shows image formation of an object on a screen by a converging lens? (1)



For question numbers 17 to 20, two statements Assertion (A) and Reason (R) are given. Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given 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 and (R) is also false.
17. A: Fresh milk in which baking soda is added, takes a longer time to set as curd. (1)
 R: Baking soda decreases the pH value of fresh milk to below 6.
18. A: The larynx opens into the trachea which is made up of cartilaginous rings. (1)
 R: The larynx plays an important role in human speech.
19. A: Sky appears blue in the day time. (1)
 R: White light is composed of seven colours.
20. A: A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus. (1)
 R: Different sense organs have different receptors for detecting stimuli.

SECTION B

21. (a) What is the chemical name and chemical formula of the salt used to remove permanent hardness of water? (2)
 (b) How does a strong acid differ from a concentrated acid?
22. The refractive indices of three media are given below: (2)

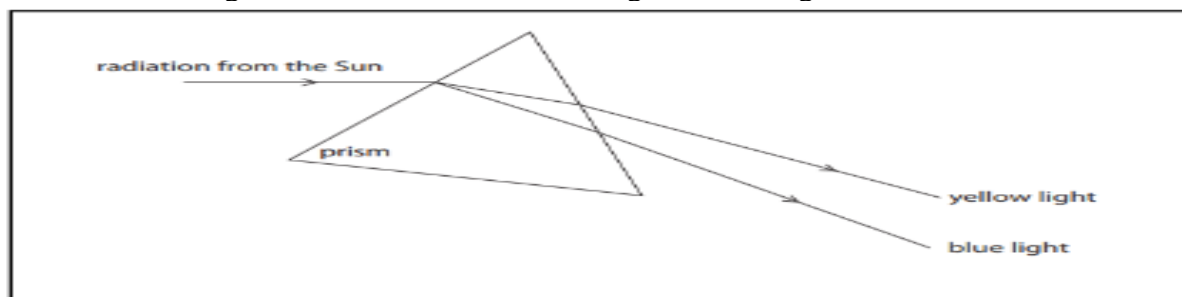
Medium	Refractive Index
A	1.6
B	1.8
C	1.5

A ray of light is travelling from A to B and another ray is travelling from B to C.

- (a) In which of the two cases the refracted ray bends towards the normal?
 (b) In which case does the speed of light increase in the second medium?

Give reasons for your answer.

23. State the phenomenon observed in the given diagram. Explain with reference to the diagram, which of the two lights mentioned will have the higher wavelength? (2)



OR

How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.

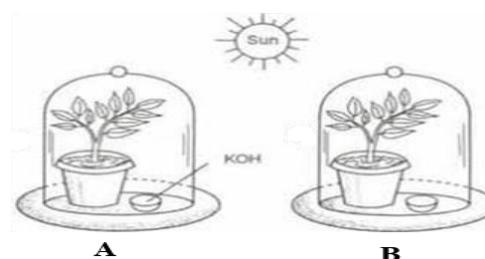
24. (a) Name the main organs of our central nervous system. (2)
 (b) Which one plays a major role in sending commands to muscles to act without involving the thinking process? Name the phenomenon involved.
25. (a) Write the two water conducting elements of xylem tissue that helps in the rapid water movement in plants. (2)
 (b) Which physical force pulls the water upwards from roots to all plant parts?
26. 1% of starch in a test tube is added to 1 ml of saliva. After keeping the mixture for an hour, a drop of iodine solution is added. (2)
 (a) Mention the change in the colour of the test tube.
 (b) What does this indicate about the salivary action of starch?

SECTION C

27. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case. (3)
 (a) In thermite reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.
 (b) Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.
 (c) Chlorine gas is passed in an aqueous potassium iodide solution to form potassium chloride solution and solid iodine.
28. Answer the following: (3)
 (a) What happens when crystals of washing soda are left open in dry air? Name the change that takes place.
 (b) Which two industries are based on the use of washing soda?
 (c) With the help of a balanced chemical equation state the reaction that takes place when sodium hydrogen carbonate is heated during cooking.

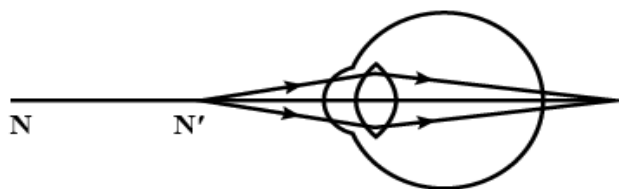
29. Observe the experimental set-up and answer the questions given below:

Note that the bell jars are inverted over the plants after the plants are kept in the dark for 72 hours. Also, the set-up is airtight. The set-up is kept in the sunlight for a few hours and then the starch test is done on the leaves of both plants.



- (i) What is the aim of this experiment?
 (ii) What is the role of KOH in this experiment?
 (iii) What would be the result of the starch test that is performed on the leaf of the plant placed in the set-up labelled as A?

30. Study the diagram given below and answer the question that follow: (3)



- (a) Name the defect of vision represented in the diagram. Give reason for your answer.
(b) List two causes of this defect.
(c) With the help of a diagram show how this defect of vision is corrected.
31. Rohit wants to have an erect image of an object using a converging mirror of focal length 40 cm. (3)
(a) Specify the range of distance where the object can be placed in front of the mirror. Justify.
(b) Draw a ray diagram to show image formation in this case.
(c) State one use of the mirror based on the above kind of image formation.
- 32.. A lens of focal length 5 cm is being used by a student in the laboratory as a magnifying glass. (3)
Her least distance of distinct vision is 25 cm.
(a) What is the magnification obtained by using this magnifying glass?
(b) She keeps a book at a distance 10 cm from her eyes and tries to read. Will she be able to read comfortably? Give the reason for your answer.
33. Write the three significances of the small intestine in our body. (3)

SECTION D

34. (a) Combustion of coke is a combination reaction. CO_2 gas formed during the reaction is not a pollutant. Then why is the combustion of coke harmful? (5)
(b) Which reaction followed by two combination reactions is involved in white wash of walls?
(c) Give one use of tin plating in daily life.
(d) How have photochemical reactions played an important role in photography?
35. (a) Explain the formation of the rainbow. Draw the necessary diagram. (5)
(b) Explain why the planets do not twinkle.
(c) Why does the sky appear dark instead of blue to an astronaut?

OR

- (a) Why are convex mirrors used as rear-view mirrors?
(b) Light passes through a rectangular glass slab and through a triangular glass prism. Using proper ray diagrams, explain in what way, the directions of the two emergent beams differ with respect to the incident beam of light.
(c) A concave lens has a focal length of 50 cm. Calculate its power.
36. (a) What is the double circulation of the blood in the human heart? (5)
(b) Represent the double circulation of the blood that occurs in humans schematically.
(c) Write the structural difference between arteries and veins.

SECTION E

37. The salt pans in Marakkanam, a port town about 120 km from Chennai are the third largest producer of salt in Tamil Nadu. Separation of salt from water is a laborious process and the salt obtained is used as raw materials for manufacture of various sodium compounds. One such compound is Sodium hydrogen carbonate, used in baking, as an antacid and in soda acid fire extinguishers. The table shows the mass of various compounds obtained when 1 litre of seawater is evaporated

Compound	Formula	Mass of solid present /g
Sodium Chloride	NaCl	28.0
Magnesium Chloride.	MgCl ₂	8.0
Magnesium Sulphate	MgSO ₄	6.0
Calcium Sulphate	CaSO ₄	2.0
Calcium Carbonate	CaCO ₃	1.0
Total amount of salt obtained		45.0

- Which compound in the table reacts with acids to release carbon dioxide? (1)
- How many grams of Magnesium Sulphate are present in 135g of solid left by evaporation of seawater? (1)
- What is the saturated solution of Sodium Chloride called? (1)
- What is the pH of the acid which is used in the formation of common salt? (1)

38.



The given image is that of a specialized slide projector. Slides are small transparencies mounted in sturdy frames ideally suited to magnification and projection, since they have a very high resolution and a high image quality. There is a tray where the slides are to be put into a particular orientation so that the viewers can see the enlarged erect images of the transparent slides.

This means that the slides will have to be inserted upside down in the projector tray. To show her students the images of insects that she investigated in the lab, the teacher brought a slide projector. Her slide projector produced a 500 times enlarged and inverted image of a slide on a screen 10 m away.

- Based on the text and data given in the above paragraph, what kind of lens must the slide projector have? (1)
- If v is the symbol used for image distance and u for object distance then with one reason state what will be the sign for v/u in the given case? (1)
- The lens used in a slide projector has a focal length of 20 cm. The slide is placed upside down 21 cm from the lens. How far away should the screen be placed from the slide projector's lens so that the slide is in focus? (1)

OR

- When a slide is placed 15 cm behind the lens in the projector, an image is formed 3 m in front of the lens. If the focal length of the lens is 14 cm, draw a ray diagram to show image formation. (not to scale) (2)

39. Our body needs to remove the wastes that build up from cell activities and digestion. If these wastes are not removed, then our cells can stop working and we can get very sick. The excretory system consists of a pair of kidneys, a pair of ureters, a urinary bladder and a urethra. Each kidney is made up of complex tubular structures called nephrons. The urine formation involves various processes in the different parts of the nephrons. Each nephron consists of a cup-shaped upper end called Bowman's capsule containing a network of capillaries called glomerulus and a renal tubule.

- Name the convoluted parts of the renal tubule of nephron. (1)
- Which are the useful substances that are reabsorbed by the renal tubule? (1)
- (i) Which blood vessel branches to form the network of glomerulus in human kidneys? (2)
(ii) Write the function of Bowman's capsule.

OR

- What is haemodialysis? How much volume of the initial filtrate is filtered by the human kidneys daily?