

BUDHA DAL PUBLIC SCHOOL PATIALA

First Term Examination (6 September 2024)

CLASS - X

PAPER- SCIENCE (SET-A)

Time: 3 hr.

M.M. 80

General Instructions:

- i) *This question paper consists of 39 questions in 5 sections.*
- 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.*
- iii) *Section A consists of 20 objective type questions carrying 1 mark each.*
- iv) *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.*
- v) *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.*
- vi) *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.*
- vii) *Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

Section - A

Q1. Strong heating of Ferrous sulphate to the formation of brown solid and two gases. This reaction is (1)

a) displacement and redox b) decomposition and exothermic

c) displacement and exothermic d) decomposition and endothermic

Q2. Which of the following statements is correct about an aqueous solution of an acid and of a base? (1)

i) Higher the pH, stronger the acid

ii) Higher the pH, weaker the acid

iii) Lower the pH, stronger the base

iv) Lower the pH, weaker the base

Options:

a) (i) & (ii) b) (ii) & (iii) c) (i) & (iv) d) (ii) & (iv)

Q3. $MnO_2 + xHCl \rightarrow MnCl_2 + yH_2O + 2Cl_2$ in order to balance the above Chemical equation, the value of x, y and z respectively are (1)

a) 6, 2, 2 b) 4, 1, 2 c) 4, 2, 1 d) 2, 2, 1

Q4. When a small amount of acid is added to water, the phenomena which occur are (1)

A) Dilution B) Neutralisation C) Formation of H_3O^+ ions D) salt formation

a) A and C b) B and D c) A and B d) C and D

Q5. Select from the following a process in which a combination reaction is involved. (1)

a) black and white photography b) burning of coal

c) burning of methane d) digestion of food

Q6. Mild non-corrosive basic salt is (1)

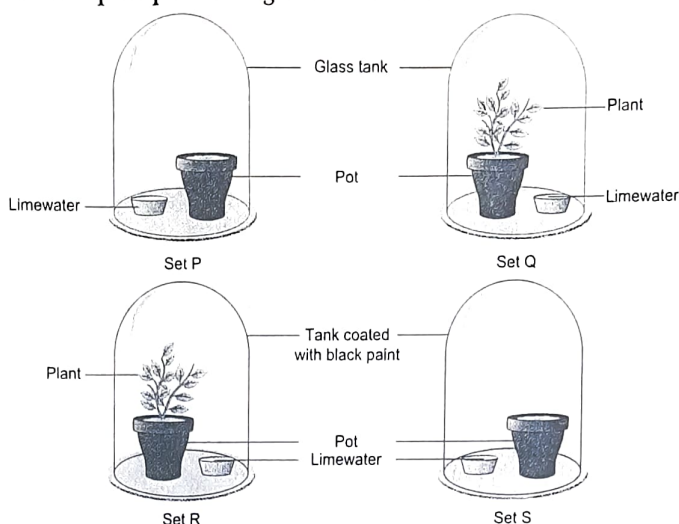
a) $Ca(OH)_2$ b) NaCl c) NaOH d) $NaHCO_3$

Q7. Translate the following equation into chemical form and balance it. (1)
Carbon disulphide burns in air to give carbon dioxide and sulphur dioxide

A-1

Q8.

Lime water turns cloudy in the presence of a gas which is a by-product of respiration. Shown below are four setups kept in sunlight for 24 hours.



In which setup is lime water expected to be the cloudiest?

- (a) Setup P (b) Setup Q (c) Setup R (d) Setup S

Q9. In which of the following groups of organisms, food materials are broken down outside the body & absorbed? (1)

- a) Mushroom, greenplants, amoeba
b) Yeast, mushroom, bread mould
c) Paramecium, Amoeba, Cuscuta
d) Cuscuta, lice, tapeworm ↑

Q10. Spinal cord originates from
a) Cerebrum b) cerebellum c) Pons d) Medulla (1)

Q11. A plant growth inhibitor hormone which causes wilting of leaves is called
a) Auxin b) Cytokinin c) Absciscic acid d) Gibberellins (1)

Q12. During pollination, plants ensures that the pollen grains from a species germinates on the stigma of the same species. Which of the following ensures this? (1)

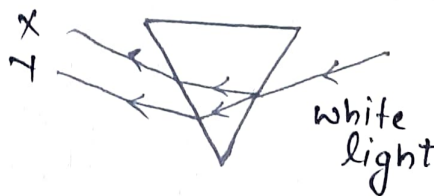
- a) chemotropism b) hydrotropism c) phototropism d) geotropism

Q13. Which of the following can make a parallel beam of light when light from a point source is incident on it? (1)

- a) Concave mirror as well as convex lens
b) Convex mirror as well as concave lens
c) Two plane mirrors placed at 90° to each others
d) Concave mirror as well as concave lens

Q14. In the diagram given below, X and Y are the end colours of the spectrum of white light. The colour of 'Y' represents the : (1)

- a) Colour of sky as seen from Earth during the day
b) Colour of the sky as seen from the Moon
c) Colour used to paint the danger signals
d) Colour of Sun at the time of noon



Q15. When a ray passes through a prism
a) it goes undeviated b) it remains parallel to the base
c) it bends towards the base d) none of the above (1)

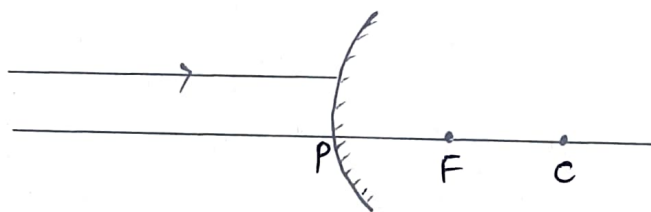
6. The lens system of human eye forms an image on a light sensitive screen, which is called as : (1)
- a) cornea b) ciliary muscles c) optic nerves d) retina

For the following questions, two statements are given - one labeled Assertion (A) and the other labeled Reason (R). 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 the assertion.
 b) Both A and R are true but Reason R is not a correct explanation of Assertion.
 c) A is true but R is false.
 d) A is false but R is true.
- Q17. Assertion : Plaster of Paris is stored in a moisture proof container (1)
 Reason: Plaster of Paris sets into a hard mass on wetting with water to form anhydrous calcium sulphate.
- Q18. Assertion : Dendrites pick up sensations and transmit the same to cell body. (1)
 Reason : Cell body contains Nissl granules.
- Q19. Assertion : A ray incident along normal to the mirror retraces its path. (1)
 Reason : In reflection, angle of incidence of always equal to angle of reflection.
- Q20. Assertion : Vena cava collects blood from lungs & distributes to all parts of body. (1)
 Reason: Aorta takes oxygenated blood to different parts of body.

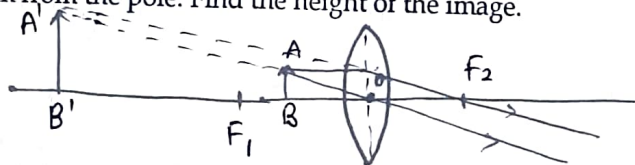
Section - B

- Q21. Why does tooth decay start when the pH of mouth is lower than 5.5 ? (2)
- Q22. Write two different ways in which glucose is oxidized to provide energy in human body. Write products formed in each case. (2)
- Q23. Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reasons for you answer. (2)
- Q24. What are the advantage and disadvantage of using a convex mirror for seeing traffic at the rear? (2)
- Q25. A ray of light is incident on a convex mirror as shown. Redraw the diagram and complete the path of this ray after reflection from the mirror. Make angle of incidence and angle of reflection on it. (2)



OR

The given lens has a focal length of 10cm. The object of height 2 mm is placed at a distance of 5 cm from the pole. Find the height of the image.



- Q26. Name the hormone which is released into blood when its sugar level rises. Name the gland which produces the hormone and its effect on sugar level (2)

OR

Which hormone is secreted by thyroid gland? Write its function. Name the disease caused by its deficiency along with its symptom.

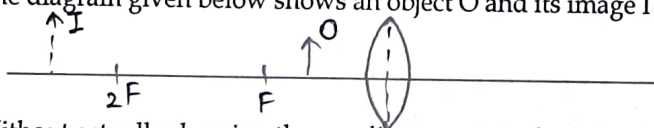
Section - C

- Q27. A solution of a substance 'X' is used for whitewashing (3)
 a) Name the substance 'X' and write its formula
 b) Write the reaction of the substance 'X' with water.
- Q28. What is Brine? What happens when an electric current is passed through it. Write equation (3) to explain your answer.

OR

Substance 'X' is used for disinfecting water. Name the substance and write chemical formula. How it is prepared from slaked lime. Write its another use.

- Q29. a) Write function of peripheral nervous system. (3)
 b) Draw a flow chart of reflex arc when we sneeze.
- Q30. Write three structural differences between arteries and veins. (3)
- Q31. When do we say that a particular person is suffering from hypermetropia? List one cause (3) of this defect. Name the type of lens used to correct this defect.
- Q32. The diagram given below shows an object O and its image I (3)



Without actually drawing the ray diagram, state the following:

- a) Type of lens (Converging/ diverging)
 b) Name an optical instrument where such an image is obtained
 c) List two characteristics of the image formed if this lens is replaced by a concave mirror of focal length 'f' and an object is placed at a distance 'f/2' in front of the mirror.
- Q33. Define the term dispersion of white light. State the colour which bends (i) the most, (ii) the least while passing through a glass prism. Draw a diagram to show the dispersion of white light. (3)

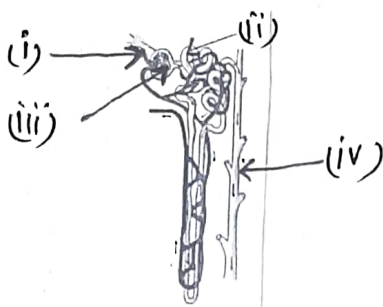
Section - D

- Q34. 1. Two solutions M and N give red and blue colour respectively with pH paper. (5)
 a) In which solution will the hydrogen ion concentration be more? Justify your answer.
 b) If both M & N are mixed and resultant mixture is tested with a pH paper. It turns green.
 What is nature of salt formed? Define the reaction of salt formation?
2. Fresh milk has pH 6. How do you think the pH will change as it turns into curd? Explain.

OR

- a) Five solutions A, B, C, D, E and tested with universal indicator showed pH 4, 1, 11, 7 (1) Most Acidic (2) weakly alkaline (3) weakly acidic
 Arrange the pH in increasing order of $[H^+]$ concentration.
- b) What is the nature of $CuSO_4$ salt. Name the acid and base. *required to make this salt.*

35. A figure given below shows a diagram of nephron. Answer the following questions related to this diagram (5)



- Label the following parts (i), (ii), (iii) & (iv)
- Write function of part (ii)
- Name four substances in the initial filtrate which are selectively reabsorbed as the urine flows along the tubule.

OR

- Give reasons :
 - Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates.
 - Ventricles have thicker muscular walls than atria.
 - Veins have valves whereas arteries do not.
- Why do multicellular organisms need another means of communication between cells besides nervous coordination?

- Q36. (5)
- What is visible spectrum?
 - Why is red used as the stopping light at traffic signals?
 - Two triangular glass prisms are kept together connected through their rectangular side. A light beam is passed through one side of the combination. Will there be any dispersion?

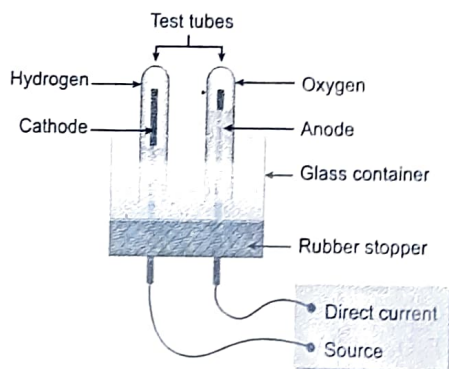
OR

- What happens when a narrow beam of (i) monochromatic light and (ii) white light passes through a glass slab and a glass prism?
- What is scattering of light?
- Why does the clear sky appear blue?

Section - E

- Q37. Read the paragraph and answer the following questions:

The diagram below shows the set-up in which electrolysis of water takes place.



- What type of reaction takes place?
- Explain why this is an example of an endothermic reaction?
- The test tube containing gas is removed carefully from the apparatus. A lit match stick is brought near the mouth of this test tube. The gas burns with an explosive "pop" sound. Identify the gas and charge on electrode on which it is collected
Write a balanced chemical equation for this Process and indicate whether energy is absorbed or released.

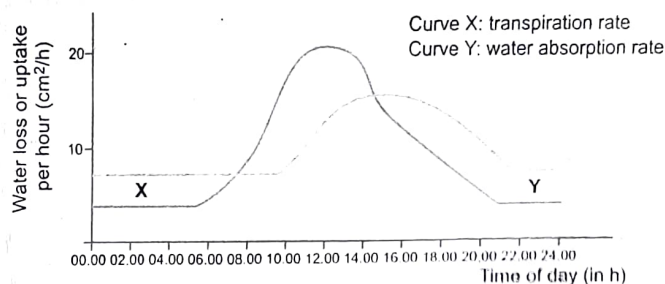
(4)

Read the paragraph and answer the following questions:

Plants have low energy needs, and can use relatively slow transport systems. The distance over which transport systems have to operate, however, can be very large in plants such as very tall trees. Plant transport systems move energy stores from leaves and raw materials from roots.

These two pathways are constructed as independently organised conducting tubes.

- 1) What do you understand by force of cohesion?
- 2) Given graph shows the rates of water absorption and transpiration of a plant during a 24 hour period.



Why there is the difference between the rates of transpiration and water absorption between 00:00 and 06:00 hours?

- 3) Which elements of xylem conduct water and dissolved minerals?
- 4) Write the factors which are responsible for absorption of water.

Q39.

Read the paragraph and answer the following questions:

(4)

The ability of a medium to refract light is expressed in terms of its optical density. Optical density has a definite connotation. It is not the same as mass density. On comparing two media, the one with the large refractive index is optically denser medium than the other. The other medium with a lower refractive index is optically rarer. Also the speed of light through a given medium is inversely proportional to its optical density.

- a) Determine the speed of light in diamond if the refractive index of diamond with respect to vacuum is 2.42. Speed of light in vacuum is 3×10^8 m/s
- b) Refractive indices of glass, water and carbon disulphide are 1.5, 1.33 and 1.62 respectively. If a ray of light is incident in these media at the same angle (say), then write the increasing order of the angle of refraction in these media.
- c) The speed of light in glass is 2×10^8 m/s and in water is 2.25×10^8 m/s. Which one of the two is optically denser and why?

OR

- c) Refractive index of water with respect to air is $4/3$ and glass is $3/2$. What is the refractive index of glass w.r.t. water?