

BUDHA DAL PUBLIC SCHOOL PATIALA
Pre - Board Examination (15 December 2025)

CLASS - X
PAPER- SCIENCE (SET-B)

Time:3 hr.

M.M. 80

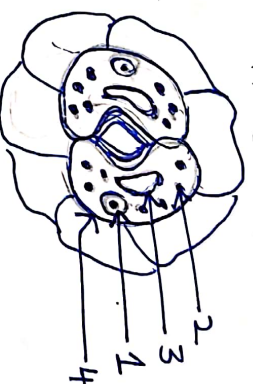
General Instructions:

- (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
Biology

- Q1. In the given diagram of a closed stomata : (1), (2), (3) and (4) respectively are (1)

- a) nucleus, chloroplast, guard cell, vacuole
- b) nucleus, chloroplast, vacuole, guard cell
- c) chloroplast, nucleus, vacuole, guard cell
- d) vacuole, guard cell, nucleus, chloroplast



- Q2. During respiration exchange of gases takes place in (1)

- a) trachea and larynx
- b) alveoli of lungs
- c) alveoli and throat
- d) throat and larynx

- Q3. Dramatic changes of body features associated with puberty are mainly because of the (1)

secretion of

- a) oestrogen from testes and testosterone from ovary
- b) estrogen from adrenal gland and testosterone from pituitary gland
- c) testosterone from testes and estrogen from ovary
- d) testosterone from thyroid gland and estrogen from pituitary gland

- Q4. Consider the following statements about the human nervous system: (1)

- i) The central nervous system consists of the brain and spinal cord
- ii) Reflex actions are voluntary responses to external stimuli
- iii) Separate areas of fore-brain are specialized for hearing, smell and sight.
- iv) The spinal cord is responsible for transmitting signals to and from the brain.

Which of the above statements are correct

- a) (i), (ii) and (iii)
- b) (ii) and (iii)
- c) (i), (iii) and (iv)
- d) (i) and (iv)

- Q5. Growth of pollen tube towards ovule is called: (1)

- a) Chemotropism
- b) Hydrotropism
- c) Phototropism
- d) Geotropism

- Q6. The decomposers in an ecosystem (1)

- a) Convert inorganic material to simpler forms
- b) Convert organic material to inorganic forms
- c) Convert inorganic materials into organic compounds
- d) Do not breakdown organic compounds

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- Q7. Which of the following groups contain components where at least one item is NOT an example of non biodegradable? (1)
- a) Grass, f lowers and leather
 - b) Grass, wood, and plastic
 - c) Fruit peels, cake and lime juice
 - d) Cake, wood, and grass

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.

- Q8. Assertion : Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled. (1)

Reason : Cellular DNA is the information source for making proteins in the cell.

- Q9. Assertion : Microorganisms decompose organic waste into harmless substances. (1)
Reason: Biodegradable substances have a harmful effect on human life.

- Q10. Write substrate and function of following enzymes. (i) Pepsin (ii) Amylase (2)
Q11. What is the other name of 'tissue fluid'? Write its two function? (2)

OR

If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your answer.

- Q12. In the food chain:- Grass → Deer → Lion operating in a forest, what will happen if all the a) Lions are removed b) Deer are removed (2)

- Q13. Name the parts of a neuron (3)
a) Where information is acquired
b) Through which information travels as an electrical impulse
c) Where this impulse must be converted into a chemical signal for onward transmission

- Q14. In an experiment, Mendel obtained 1014 plants out of which 787 were having round seeds and 227 had wrinkled seeds in F₂ generation. (3)
a) What is the approximate ratio obtained in F₂ generation?
b) Under which law do you find this ratio?
c) Why is this law so called?

- Q15. Stamen is the male reproductive part and it produces pollen grains that are yellowish in colour. Pistil is present in the centre of a flower and is the female reproductive part that produces ovule and each ovule has an egg cell. Plant X bears bisexual flowers i.e., contains both stamens and pistil. Plant Y bears unisexual flowers i.e. contain pistils. (4)
On the basis of above information give answers of the following questions:

- a) Give an example of plants that could be placed at the position of X and Y.
 - b) Which type of pollination and pollinating agents are required in case of X and Y?
 - c) The removal of which part of flower can prevent self pollination in plant X?
- OR
- c) What is the fate of fusion product of pollen grains and ovule?

- Q16. I) (a) List three events that occur during the process of photosynthesis. (5)
(b) Design an experiment to show that sunlight is essential for photosynthesis.
OR

II) a) Priya was taking a stroll around a park and she noticed a fallen log covered in mushrooms. These mushrooms were thriving on the decaying wood, extracting nutrients from it. What kind of nutrition does this depict? How is it different from holozoic nutrition?

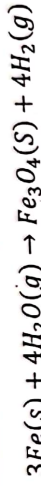
b) State the functions of liver and pancreas

c) Name the organ which performs the following functions in humans:
(i) Absorption of digested food (ii) Absorption of water

Section - B Chemistry

(1)

Q17. Which of the following statements about the given reaction are correct?

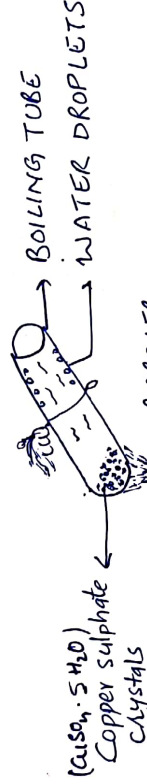


- i) Iron metal is getting oxidized
- ii) Water is getting reduced
- iii) Water is acting as reducing agent
- iv) Water is acting as oxidizing agent

a) (i), (ii) and (iii) b) (iii) and (iv) c) (i), (ii), and (iv) d) (ii) and (iv)

(1)

Q18. The colour of copper sulphate crystals changes from blue to



- a) red b) colourless c) white d) green

(1)

Q19. $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O} + \frac{3}{2} \text{H}_2\text{O} \rightarrow \text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ The common names of A and B are

(A) (B)

- | | |
|----------------------------------|-------------------------------|
| A | B |
| a) calcium hemihydrates | gypsum |
| b) gypsum | calcium hemihydrate |
| c) gypsum | calcium sulphate hemihydrates |
| d) calcium sulphate hemihydrates | gypsum |

Q20. Sodium hydroxide + Indicator (A) $\rightarrow$ The colour of A changed to Pink. A is

- a) methyl orange b) phenolphthalein c) litmus paper d) turmeric

Q21. $\text{Al}_2\text{O}_3 + 2\text{NaOH} \rightarrow 2(\text{A}) + \text{H}_2\text{O}$ the product (A) obtained in the above reaction

- a) $\text{Al}(\text{OH})_2$ b) Na_2O c) NaAlO_2 d) AlNaO_2

Q22. Food can be coated with tin but not with zinc because

- a) zinc is costlier than tin
- b) zinc has higher melting point
- c) zinc is more reactive than tin
- d) zinc is less reactive than tin

Q23. Which of the following carbon compounds belong to the same homologous series?

- a) CH_4O and $\text{C}_2\text{H}_6\text{O}$ b) CH_4O and $\text{C}_2\text{H}_6\text{O}_2$
- c) $\text{C}_2\text{H}_6\text{O}$ and $\text{C}_2\text{H}_6\text{O}_2$ d) $\text{C}_2\text{H}_6\text{O}$ and C_2H_6

(1)

B-3

Q24.

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:

- Both A and R are true and R is the correct explanation of the assertion.
- Both A and R are true but Reason R is not a correct explanation of Assertion.
- A is true but R is false.
- A is false but R is true.

Assertion : Hydrogen is not a metal but it has been assigned a place in the reactivity series of metals.

Reason: Hydrogen has a tendency to lose electron and forms a positive ion, H^+ .

Q25.

A metal nitrate A on heating gives a metal oxide along with evolution of a brown coloured gas B and a colourless gas, which helps in burning. Aqueous solution of A when reacted with potassium iodide forms a yellow precipitate.

- Identify A and B.
- Name the type of both the reactions involved in the above statement.

Q26.

What happens when a piece of

- zinc metal is added to copper sulphate solution?
- aluminium metal is added to dilute hydrochloric acid?
- silver metal is added to copper sulphate solution?

Also, write the balanced chemical equation if the reaction occurs.

Q27.

Write electronic configurations of two elements X (Atomic no. 12) and Y (Atomic no. 17). Show the formation of ionic compound when X and Y combine with each other. Write the name and formula of the compound formed. State what would happen if electric current is passed through the aqueous solution of this compound. Name the ion that will reach at (i) cathode, and (ii) anode.

Q28.

Read the following and answer the questions:

On the basis of reactivity, metals are grouped into three categories:

- Metals of low reactivity
- Metals of medium reactivity
- Metals of high reactivity

Therefore, metals are extracted in pure form from their ores on the basis of their chemical properties. Metals of high reactivity are extracted from their ores by electrolysis of the molten ore.

Metals of low reactivity are extracted from their sulphide ores, which are converted into their oxides. The oxides of these metals are reduced to metals by simple heating.

- Name the process of reduction used for a metal that gives vigorous reaction with air and water both.
- Carbon cannot be used as a reducing agent to obtain aluminium from its oxide. Why?
- Describe briefly the method to obtain mercury from cinnabar. Write the chemical equation for the reactions involved in the process.

OR

- Write two differences between calcinations and roasting

Ethanol (commonly known as alcohol) is an important carbon compound widely used in industries, hospitals, etc. Because it is a very good solvent, it is used in medicines such as cough syrups, tincture of iodine and many ionics. As it is a cleaner fuel, ethanol is used as an additive in petrol in most of the developed countries of the world.

Q29.

- Write the structure of ethanol.

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- ii) Name the products formed when ethanol burns in sufficient air (oxygen).
 iii) State what happens when 5% solution of alkaline potassium permanganate is added to warm ethanol. Draw the structure of the product formed and state the role of 5% solution of alkaline potassium permanganate in the reaction.

OR

- i) An organic compound A of molecular formula C_2H_4 on reduction gives another compound B of molecular formula C_2H_6 . B on reaction with chlorine in the presence of sunlight gives C of molecular formula C_2H_5Cl .

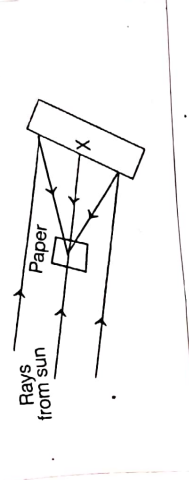
- a) Name the compounds A, B and C
 b) Write chemical equation for the conversion of A to B and B to C.
 ii) Explain cleansing action of soap.

Section - C

Physics

(1)

On a sunny day, Ravi of class X, observes his younger brother looking at the sun directly. He warned him not to look at the sun directly or even into a mirror reflecting sunlight as it may damage your eyes. He explained him by using optical object, as shown in the given figure.

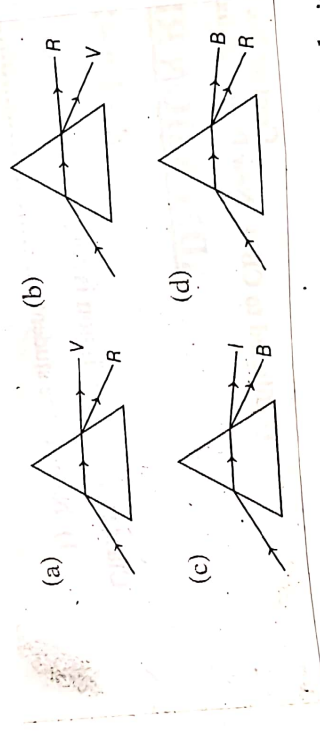


Identify the optical object X and its nature.

- a) X = Concave mirror as diverging mirror
 b) X = Concave mirror as converging mirror
 c) X = Convex mirror as diverging mirror
 d) X = Convex mirror as converging mirror

(1)

Q31. Which one of the following figures correctly represents the passage of white light through the prism?



(1)

Q32.

Assertion : Higher is the refractive index of a medium, lesser is the velocity of light in that medium.

Reason : Refractive index is directly proportional to velocity.

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(2)

A student has focused the image of an object of height 3 cm on a white screen using a concave mirror of focal length 12cm. If the distance of the object from the mirror is 18 cm. Find the values of the following:

- a) Distance of the image from the mirror
 b) Height of the image

Q33.

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Which has a higher resistance : a 50 W – 220 V lamp or a 25 W – 220 V lamp? Calculate the ratio of their resistances. (2)

OR

A piece of wire of resistance R is cut into five equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is R' then find the ratio R/R'. (3)

- Q35. a) With the help of a labelled diagram, explain the distribution of magnetic field due to a current through a circular loop. (3)
 b) When is the force experienced by a current-carrying conductor placed in a magnetic field largest?
 c) Two fuse wires of same length are rated 5 A and 20 A. Which of the two fuse wires is thicker and why? (3)

Q36. A student needs to make a 0.12Ω resistor. She has some copper wire of 0.80 mm diameter. Resistivity of copper is $1.8 \times 10^{-8} \Omega \text{m}$

- a) Determine the cross-sectional area of the wire. (3)
 b) Calculate the length of wire required for the 0.12Ω resistor. (3)

Q37. A person used lenses of +2.0 D power in his spectacles for the correct set of observation.

- a) Name the defect of vision is suffering from. (4)
 b) List two causes of this defect.
 c) Determine the focal length of the lenses used in the spectacles. (4)

Q38. Read the following passage and answer the questions that follow:
 Study the data given below showing the focal length of three concave mirror A, B and C and the respective distances of objects placed in front of the mirrors.

Case	Mirror	Focal Length (cm)	Object Distance (cm)
1	A	20	45
2	B	15	30
3	C	30	20

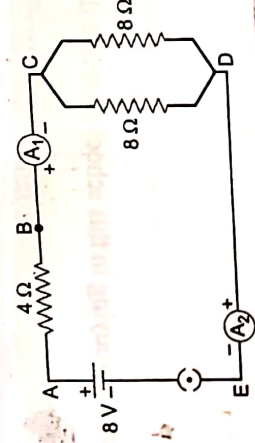
In which one of the above cases the mirror will form a diminished image of the

- a) object? Justify your answer.
 b) List two properties of the image formed in case 2.
 c) What is the nature and size of the image formed by mirror C? Draw ray diagram to justify your answer. (5)

OR

- c) An object is placed at a distance of 18 cm from the pole of a concave mirror of focal length 12 cm. Find the position of the image formed in this case. (5)

Q39. Find out the following in the electric circuit given in figure alongside:



B-6

- a) Effective resistance of two $8\ \Omega$ resistors in the combination.
- b) Current flowing through $4\ \Omega$ resistor.
- c) Potential difference across $4\ \Omega$ resistance.
- d) Power dissipated in $4\ \Omega$ resistor.
- e) Difference in ammeter readings. If any

OR

Two lamps, one rated at $40\ \text{W} - 220\ \text{V}$ and the other at $60\ \text{W} - 220\ \text{V}$, are connected in parallel to the electric supply at $220\ \text{V}$.

- a) Draw a circuit diagram to show the connections.
- b) Calculate the current drawn from the electric supply source
- c) Calculate the total energy consumed by the two lamps together when they operate for one hour.