FIRST TERM EXAMINATION—2024-25

CLASS–X

SUBJECT–GENERAL SCIENCE

Time : 3 Hrs. **M.M. : 80**

GENERAL INSTRUCTIONS:

1. *The question paper comprises three sections: Physics, Chemistry, and Biology. All questions are compulsory.*
2. *Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*
3. *Directions: In Q5 (Phy), Q7 (Chem) and Q7 and Q8 (Bio), a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of the statements, given below, mark the correct answer as:*
   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.*
4. *In case study, parts a and b are compulsory, but there is a choice in part c.*
5. *For MCQs,write the correct option along with the statement.*
6. *Physics, chemistry and biology questions are to be attempted in separate sheets. At the end of the examination, please tie the sheets in the order: physics-chemistry-biology.*

PHYSICS (27 Marks)

1. An object is placed at $2F_1$ of a convex lens of focal length 'F'. The distance between the object and its image is: (1)

   a) F b) 2F

   c) 4F d) between F and 2F

2. When light rays enter the eye, most of the refraction occurs at the – (1)

   a) Pupil b) Iris

   c) Crystalline lens d) Outer surface of cornea

3. Which of the following best describes the effect of atmospheric refraction on the apparent position of the Sun during sunrise and sunset? (1)

a) The Sun appears to rise later and set earlier than it actually does.

b) The Sun appears to rise earlier and set later than it actually does.

c) The Sun appears to rise later and set later than it actually does.

d) The Sun appears to rise and set at the same time as it actually does.

4. Two lenses of focal lengths −20cm and +10cm are put in combination. The power of the combined lens is (1)

a) –5 D

b) -2D

c) +5 D

d) +2 D

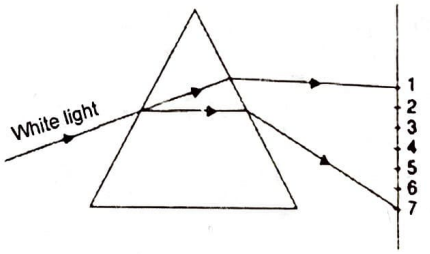
5. **Assertion :** The phenomenon of scattering of light by the colloidal particles gives rise to the Tyndall effect.

Reason : The colour of the scattered light depends on the size of the scattering particles. (1)

6. a) What is the minimum possible distance between an object and its real image formed by a concave mirror? Justify your answer.

b) On entering in a medium from air, the speed of light becomes half of its value in air. Find the refractive index of that medium with respect to air? (2)

7. A beam of white light falling on a glass prism gets split up into seven colours marked as shown in the diagram.



a) Name the phenomenon.

b) Which two positions correspond closely to the colour of

i) clear sky and

ii) 'danger' signal?

OR

7. Why do stars twinkle? (2)

8. An object of size 7.0 cm is placed at 27 cm in front of a convex lens of focal length 18 cm. At what distance from the lens should a screen be placed, so that a sharp focussed image can be obtained? Find the size and the nature of the image. (3)

9. A student wants to project the image of a candle flame on a screen 48 cm in front of a spherical mirror by keeping the flame at a distance of 12 cm from its pole.

a) Which type of mirror should he use? Concave mirror

b) Find the linear magnification of the image produced. $m = +2$

c) Draw a ray diagram to show the image formation in this case. (3)

10. Draw a labelled diagram to show the formation of a rainbow. List two essential conditions to observe a rainbow. (3)

11. a) The refractive index of diamond is 2.42. What is the meaning of this statement?

b) A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like kerosene or turpentine. Support your answer with reason.

c) The refractive indices of three media are given below:

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.

i) In which of the two cases the refracted ray bends towards the normal?

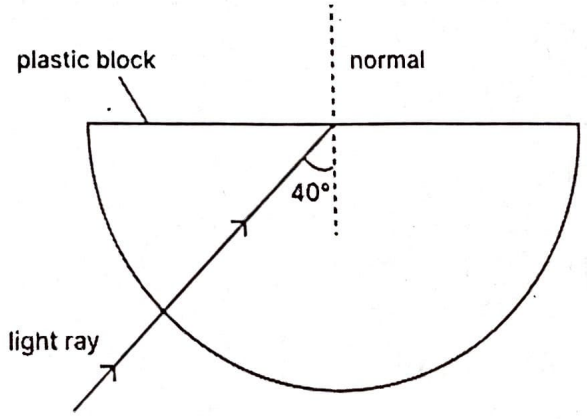
ii) In which case does the speed of light increase in the second medium? (5)

OR

11 a) What is the cause of refraction of light when it passes from one medium to another?

b) Draw a well labelled ray diagram to show the refraction of light through a glass prism showing angle of deviation.

c) In the figure below a light ray travels from air into the semi-circular plastic block.



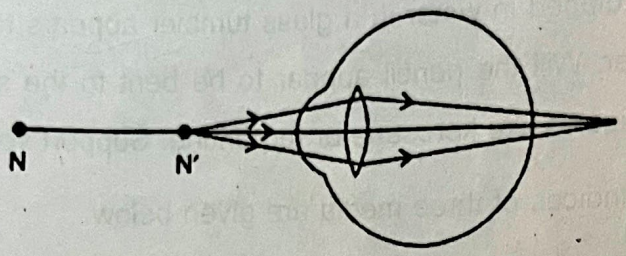
i) Give a reason why the ray does not deviate at the semi-circular boundary of the plastic block.

ii) Complete the ray diagram of the above scenario when the light ray comes out of the plastic block from the top flat end. (5)

12. **Case Study**

Sometimes, the eye may gradually lose its power of accommodation. In such conditions, the person cannot see the objects distinctly and comfortably. The vision becomes blurred due to the refractive defects of the eye.

Study the diagram given below and answer the following questions:



a) Identify the defect shown in the diagram.

b) Give two possible reasons for the above defect.

c) Draw a neat labelled diagram to show how the above defect can be corrected using a suitable lens.

OR

c) The far point of a myopic person is 80 cm in front of the eye. What is the nature and power of the lens required to correct the problem? (1+1+2)

CHEMISTRY (26 Marks)

1. Select from the following a decomposition reaction in which source of the energy for decomposition is electricity:- (1)

a) $CaCO_3 \rightarrow CaO + CO_2$ b) $2AgBr \rightarrow 2Ag + Br_2$

c) $2H_2O \rightarrow 2H_2 + O_2$ d) $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$

2. In the following chemical equation:- (1)

$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

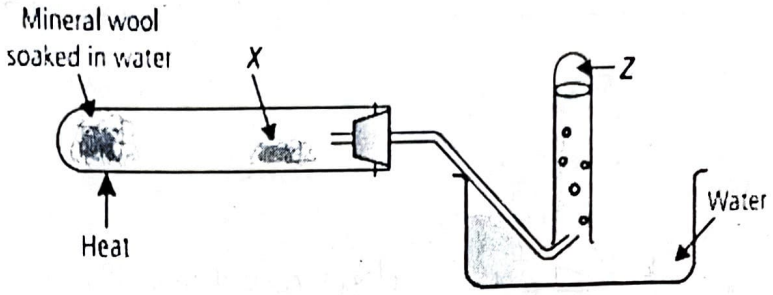
a) Fe is oxidised and H_2O is reduced b) H_2O is reduced

c) Fe is reduced and H_2O is oxidised d) Fe is oxidised

3. Sheela adds 2ml of aqueous solution of barium chloride to 2ml aqueous solution of sodium sulphate. She observes (1)

a) white precipitate of sodium chloride
b) yellow precipitate of barium sulphate.
c) yellow precipitate of sodium chloride
d) white precipitate of barium sulphate.

4. The given apparatus shows the reaction of steam with solid 'X'. (1)



The equation for the reaction is:-

Steam + Solid 'X' → Solid 'Y' (Residue)+ Gas 'Z' X, Y and Z are respectively.

a) copper, copper oxide, oxygen
b) lead, lead oxide, hydrogen
c) silver, silver oxide, oxygen
d) iron, iron oxide, hydrogen.

5. Correct the following statement by substituting the **X** and **Y** with the correct option. (1)

"X can't be drawn into wires because it is not Y in nature."

	X	Y
a	Coal	Ductile
b	Copper	Malleable
c	Aluminium	Ductile
d	Coal	Malleable

6. A metal M does not liberate hydrogen from acids but reacts with oxygen to give a black coloured product. (1)

The equation for the reaction of metal M with oxygen is:-

a) $2Cu + O_2 \rightarrow 2CuO$
b) $2Mg + O_2 \rightarrow MgO$
c) $2Al + 3O_2 \rightarrow Al_2O_3$
d) $2Pb + O_2 \rightarrow 2PbO$

7. **Assertion (A) :** During electrolytic refining of metals, a thin strip of pure metal is taken as the cathode.

(c) **Reason (R) :** In the electrolytic refining, metal is deposited at the cathode. (1)

8. 2 g of silver chloride is taken in a China dish and the China dish is placed in sunlight for sometime. What will be your observation in this case? Write the chemical reaction involved in the form of a balanced chemical equation. (2)

9. a) A milkman adds a very small amount of baking soda to fresh milk. Why?

b) Why does distilled water not conduct electricity, whereas rain water does? (1+1=2)

10. a) Rewrite the following chemical equation mentioning the state symbols:

$$Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$$

b) What do you observe when zinc granules are added to copper sulphate solution.

c) Oil and fat containing food items are flushed with nitrogen. Why? (1+1+1=3)

11. a) Show the formation of KCl by electron transfer method.

b) An element X loses electrons to element Y and forms a compound Z. "Z has a high melting point." Justify this statement. (2+1=3)

OR

11. Metallic oxide of zinc, magnesium and copper were heated with following metals :

Metal	Zinc	Magnesium	Copper
Zinc oxide	—	Displacement	A
Magnesium oxide	B	—	No reaction
Copper oxide	C	D	—

i) What will come in the place of A, B, C and D?

ii) Arrange the metals in decreasing order of their reactivity. (2+1=3)

12. a) 2 mL of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube.

When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and the test to detect the gas.

$X = NaHCO_3 \rightarrow Na_2CO_3 + CO_2 + H_2O$

b) A chemical substance X is used in making cakes. When heated, it liberates a gas Y and forms a compound Z which gives bitterness to the cake.

i) Name X, Y and Z.

ii) Write chemical equation for the reaction.

iii) How is the bitterness removed? Acetic Acid. (2+3=5)

OR

12. a) Name the products obtained during the electrolysis of brine solution and the electrodes at which they are obtained

b) Give one use each of any of the two byproducts of electrolysis of brine solution. (3+2=5)

13. **(Case Study)** Read the following paragraph and answer the questions given below:-

During extraction of metals, metals low in the activity series are very unreactive. The oxides of these metals can be reduced to metals by heating alone The metals in the middle of the activity series such as iron, zinc, lead, copper, are moderately reactive. These are usually present as sulphides or carbonates in nature. It is easier to obtain a metal from its oxide, as compared to its sulphides and carbonates. Therefore, prior to reduction, the metal sulphides and carbonates must be converted into metal oxides. The metals high up in the reactivity series are very reactive. They cannot be obtained from their compounds by heating with carbon.

a) How are metals high in the reactivity series obtained? electrolysis.

b) Why highly reactive metals cannot be obtained by heating their oxides with carbon?

c) Name the methods by which metal oxide from sulphide and carbonate ores are obtained. Give one difference between the two methods roasting calcination lack of oxygen, abundance of oxygen.

OR

c) Write the chemical equations for extraction of zinc from zinc sulphide. (1+1+2=4)

BIOLOGY (27 Marks)

1. In plants,waste products like resins and gums are stored in : (1)

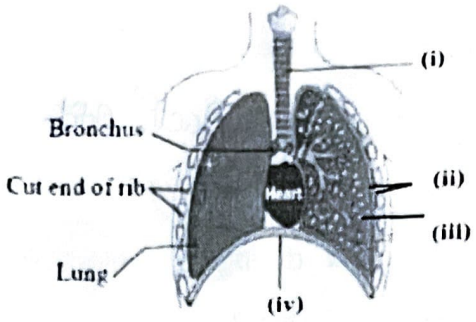
a) leaves that fall off

b) old xylem

c) Phloem

d) cellular vacuoles

2. Carefully study the diagram of the human respiratory system with labels (i), (ii), (iii) and (iv). Select the option which gives correct identification and main function and / or characteristic. (1)



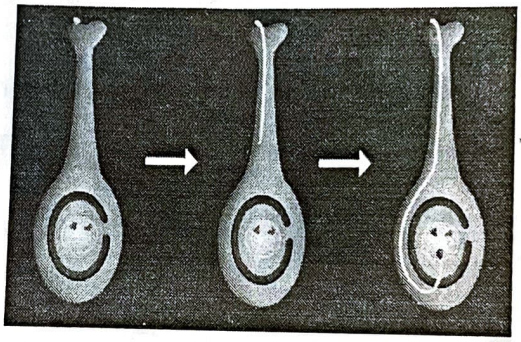
a) i) Trachea : It is supported by bony rings for conducting inspired air.

b) ii) Ribs : When we breathe out, ribs are lifted.

c) iii) Alveoli : Thin-walled sac like structures for exchange of gases.

d) iv) Diaphragm: It is pulled up when we breathe in.

3. Identify the type of tropism depicted in the given diagram : (1)



a) Hydrotropism

b) Phototropism

c) Geotropism

d) Chemotropism

4. The substance that promotes cell division in plants is (1)

a) Auxin

b) Gibberellin

c) Abcissic acid

d) Cytokinin

5. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose? (1)

a) Regeneration

b) Budding

c) Vegetative propagation

d) Sexual reproduction

6. Which of the following organisms causes a disease called Kala-azar? (1)

a) Amoeba
b) Plasmodium
c) Leishmania
d) Paramecium

7. **Assertion :-** Plants have low energy needs. ~~True~~
Reason :- Plant bodies have a large proportion of dead cells. ~~False~~ (1)

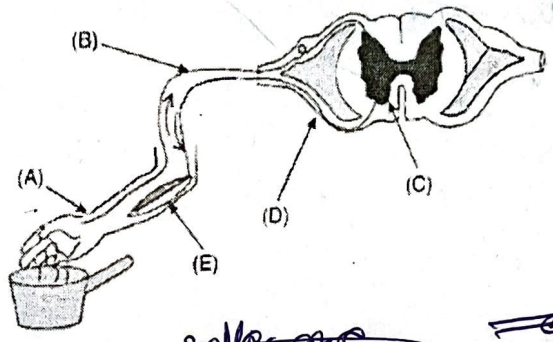
8. **Assertion** :- DNA copying is a major event in the process of reproduction. ~~True~~
Reason :- DNA copying is important for the maintenance of body design features. (1)

9. Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement. (2)

OR

9. State the events occurring during the process of photosynthesis. Is it essential that these steps take place one after the other immediately? (2)

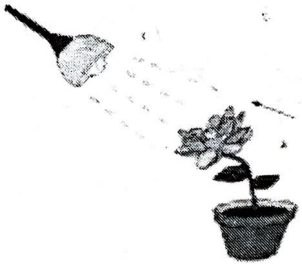
10. Observe the given diagram and answer the following questions :



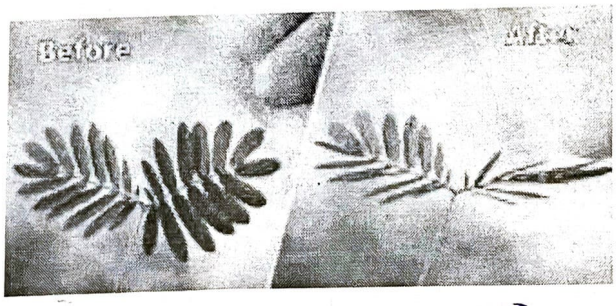
a) Which process is shown in the given diagram. Mention the part of the body which controls this process.

b) Identify the part labeled as **B** and **E.** (2)

11. Observe the given diagram answer the following questions:



(A)



(B)

a) Identify the stimulus and the type of movements shown in figure **A** and **B**.

b) Give one difference between the type of movements shown above. (3)

12. a) What happens when Planaria is cut into two pieces?

b) Explain, only diagrammatically, the process of binary fission in Amoeba. (3)

13. a) Why do tendrils coil around hard rough objects?

b) Name the hormones responsible for the regulation of

i) Balance of calcium and phosphate ions

ii) Metabolism of carbohydrates, fats and proteins

iii) Blood pressure (5)

OR

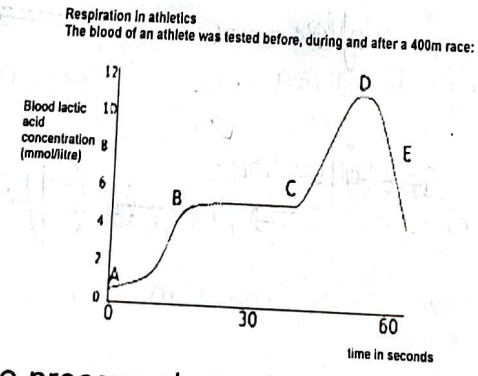
13. a) What is the feedback mechanism of hormonic regulation? Explain by taking an example of insulin.

b) Give two limitations of electric impulse as a medium of transmission of information in an organism.

c) Name the part of the brain that is responsible for the following activities -

i) Dancing ~~Cerebrum~~ Cerebellum ii) Salivation medulla. (5)

14. **(Case Study)** All living cells require energy for various activities. This energy is available by the breakdown of simple carbohydrates. The graph given below represents the blood lactic acid concentration of an athlete during a race of 400 m and shows a peak at point D. Observe the given graph and answer the following questions:



a) Identify and define the process shown in the above graph at point **D**. Anaerobic respiration

b) Give the end products of the above process. ~~Pyruvate~~ lactic acid + Energy

c) Give differences between breathing and respiration.

OR

c) Write the complete word equation involved in the breakdown of glucose in Yeast. Also mention the form in which energy is released in this process. (1+1+2=4)

–x–x–