



PRINCE ACADEMY

OF HIGHER EDUCATION

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SAMPLE PAPER - I : 2025-26

CLASS : X

Time : 03 Hours

SCIENCE (086)

M. M. : 80

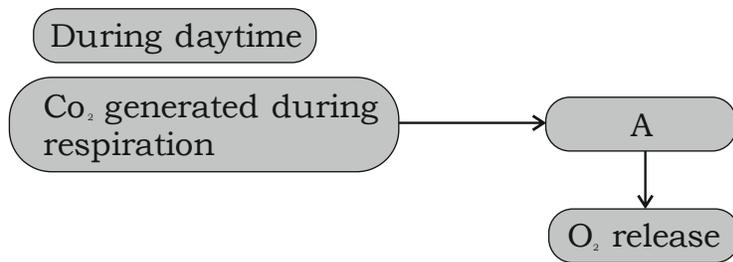
General Instructions:

- This question paper consists of 39 questions in 3 sections. Section A is Biology (30 Marks), Section B is Chemistry (25 Marks) and Section C is Physics (25 Marks).
- 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)

- 01.** In which the biomagnification will be highest out of these? 1
(a) Producer (b) Herbivore (c) Carnivore (d) Decomposer
- 02.** Which of the following statements are false? 1
(i) Sudden action in response to something in the environment is called reflex action.
(ii) Sensory neurons carry signals from spinal cord to muscles.
(iii) Motor neurons carry signals from receptors to spinal cord.
(iv) The pathway taken by nerve impulse in a reflex is called reflex arc.
(a) (i) and (ii) (b) (i) and (iv) (c) (ii) and (iii) (d) (i), (ii) and (iii)
- 03.** Which of the following is not controlled by genes? 1
1. Weight of a person 2. Height of a person
(a) only 1 (b) only 2
(c) both 1 and 2 (d) sometimes 1 and sometimes 2
- 04.** Observe the given flowchart and identify the blank A from the given options. 1



- (a) Respiration (b) Photosynthesis (c) Transpiration (d) Fermentation

05. Which of the following is the correct sequence of events of sexual reproduction in a flower? 1
- (a) Pollination, fertilisation, seedling, embryo
 (b) Seedling, embryo, fertilisation, pollination
 (c) Pollination, fertilisation, embryo, seedling
 (d) Embryo, seedling, pollination, fertilisation
06. A student can still play a piano piece flawlessly even after not practicing for months. This ability to remember and execute the piano piece without recent practice involves which part of the brain? 1
- (a) Cerebrum (b) Cerebellum (c) Medulla (d) Hypothalamus
07. Match the words in column - 1 with those which are most appropriate in column -2 1

Column - 1	Column - 2
A. Spirogyra	1. Fragmentation
B. Rhizopus	2. Multiple Fission
C. Hydra	3. Spore formation
D. Plasmodium	4. Regeneration

- (a) A-2, B-4, C-1, D-3 (b) A-1, B-3, C-2, D-4
 (c) A-1, B-3, C-4, D-2 (d) A-3, B-2, C-1, D-4

The following questions consist of two statements - Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

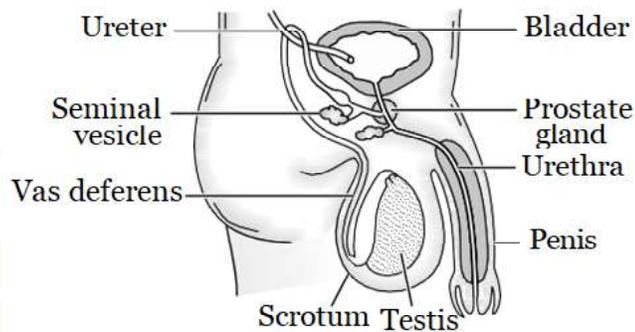
- (a) Both A and R are true, and R is the correct explanation of A.
 (b) Both A and R are true, but R is not the correct explanation of A.
 (c) A is true, but R is false.
 (d) A is false, but R is true.
08. **Assertion (A)** : The mineral essential for the functioning of the thyroid gland is iodine. 1
Reason (R) : Use of Iodised salt in food is recommended because iodine is the active ingredient in the production of thyroxine.
09. **Assertion (A)** : Surgical methods are most effective methods of contraception done by removal of gamete producing organs. 1
Reason (R) : Surgical method blocks gametes transport and hence prevent fertilisation.
10. We do not clean ponds or lakes, but an aquarium needs to be cleaned. Why? 2
11. Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement. 2

OR

Write two different ways in which glucose is oxidised to provide energy in human body. Write the products formed in each case.

12. Explain the impact of biological magnification on higher trophic level organisms. 2

- 13. (A)** All information about our environment is detected by specialised cells. Write the name given to such cells and also mention where they are located. 3
- (B)** Write two limitations of the use of electrical impulses.
- 14.** A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other. 3
- (A)** List your observations regarding :-
- Colour of stem in their F_1 progeny.
 - Percentage of brown stemmed plants in F_2 progeny, if F_1 plants are self-pollinated.
 - Ratio of GG and Gg in the F_2 progeny.
- (B)** Based on the findings of this cross, what conclusion can be drawn?
- 15.** Rahul was studying about human male reproductive system and came across the following diagram, which consists of different parts. 1+1+2=4



- (A)** Help Rahul identify the part that is responsible for the secretion of testosterone.
- (B)** What is the reason for the testes being placed at a separate scrotal sac?
- (C)** What kind of fluid is secreted by seminal vesicles and prostate gland? Also, state its role in sexual reproduction.

OR

- (C)** What kind of hormone is produced by testes? Why is it important?

- 16. Attempt either option A and B** 5

- (A)** (i) Draw a neat diagram of human excretory system and label the following parts.
- (a) Ureter (b) Kidney (c) Urethra (d) Urinary bladder
- (ii) What are nephrons? How is a nephron involved in the filtration of blood and formation of urine?

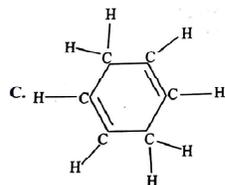
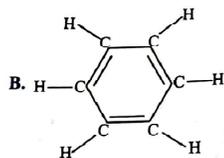
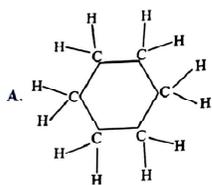
OR

- (B)** Give reasons:-

- Ventricles have thicker muscular walls than atria.
- Transport system in plants is slow.
- During the daytime, water and minerals travel faster through xylem as compared to the night.
- Veins have valves whereas arteries do not.
- Write the function of valves present in between atria and ventricles.

SECTION - B
(CHEMISTRY)

17. Consider the structures of the three cyclic carbon compounds A, B and C given below and select the correct option from the following: 1



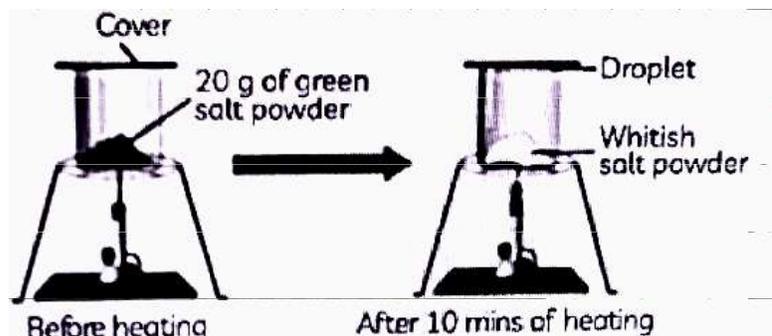
- (a) A and C are isomers of hexane and B is benzene.
 (b) A is an isomer of hexane, B is benzene and C is an isomer of hexene.
 (c) A is a saturated cyclic hydrocarbon and B and C are unsaturated cyclic hydrocarbons.
 (d) A is cyclohexane and B and C are the isomers of benzene.
18. Raman and Siya thought of playing a game. Raman blindfolded Siya and then asked her to perform a lab test to detect the presence of acid in a given solution. Which acid base indicator will be used by Siya? 1
- (a) Vanilla essence (b) Phenolphthalein
 (c) Litmus (d) Universal indicator
19. An element 'M' has 50% of the electrons filled in the 3rd shell as in the 2nd shell. The atomic number of 'M' is: 1
- (a) 10 (b) 12 (c) 14 (d) 18
20. Which of the following salt do not have the water of crystallisation? 1
- (i) Bleaching powder (ii) Plaster of Paris
 (iii) Washing soda (iv) Baking soda
- (a) (ii) and (iv) (b) (i) and (iii) (c) (ii) and (iii) (d) (i) and (iv)
21. Which of the following is not an acidic salt? 1
- (a) CuSO_4 (b) NH_4Cl (c) FeCl_3 (d) CH_3COONa
22. The compound obtained on reaction of iron with steam is/are: 1
- (a) Fe_2O_3 (b) Fe_3O_4 (c) FeO (d) Fe_2O_3 and Fe_3O_4
23. Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are listed. 1
- (i) Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.
 (ii) Calcium oxide reacts with dilute hydrochloric acid and aqueous sodium hydroxide.
 (iii) Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.
 (iv) Sulphur dioxide does not react with either dilute hydrochloric acid or aqueous sodium hydroxide.
- Which statement are correct?
- (a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iv) (d) (iii) and (iv)

The following question consist of two statements. Assertion (A) and Reason (R).

Answer the question by 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.
24. **Assertion (A) :** On adding dil. HCl to a test tube containing a substance 'X', a colourless gas is produced which gives a pop sound when a burning match stick is brought near it. 1
- Reason (R) :** In this reaction metal 'X' is displaced by Hydrogen.

25. "We need to balance a skeletal chemical equation". Give reason to justify the statement. 2
26. Shalini weight 10 g of an unknown green-coloured salt and put it in the beaker and covered it with a lid. She then heated the salt for about 20 minutes by putting the beaker on the Bunsen burner with the help of wire gauze and tripod stand. After 20 minutes, she observed that the salt is turned into a whitish powder and there were some droplets on the inner surface of the lid used to cover the beaker. 3



When Shalini added a few drops of water to the newly formed whitish powder, it turned green again.

- (A) What is the chemical name and formula of this green-coloured salt?
 (B) What are the drops that Shalini noted on the inner surface of the beaker's lid? Why are such droplets seen on the inner surface of the beaker?
 (C) Support the transformation of the whitish powder into the green-coloured salt by providing a suitable reason. Also, write the chemical equation for the same.
27. (A) State any two observations when an electric current is passed through acidulated water, in a container having each electrode covered by test tubes filled with water. 3
 (B) Write the ratio of the mass of the gas collected at the cathode to the mass of the gas collected at the anode.
28. The melting points and boiling points of some ionic compounds are given below: 4

Compound	Melting Point (K)	Boiling Point (K)
NaCl	1074	1686
LiCl	887	1600
CaCl ₂	1045	1900
CaO	2850	3120
MgCl ₂	981	1685

These compounds are termed ionic because they are formed by the transfer of electrons from a metal to a non-metal. The electron transfer in such compounds is controlled by the electronic configuration of the elements involved. Every element tends to attain a completely filled valence shell of its nearest noble gas or a stable octet.

- (a) Show the electron transfer in the formation of magnesium chloride.
 (b) List two properties of ionic compounds other than their high melting and boiling points.
 (c) While forming an ionic compound say sodium chloride, how does sodium atom attain its stable configuration?

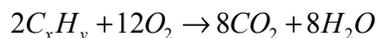
OR

- (c) Give reason:
 (i) Why do ionic compounds in the solid state not conduct electricity?
 (ii) What happens at the cathode when electricity is passed through an aqueous solution of sodium chloride?

29. Attempt either option A or B

5

(A) A hydrocarbon with the formula C_xH_y undergoes complete combustion as shown in the following equation:



(a) What are the values of 'x' and 'y'?

(b) Give the chemical (IUPAC) name of the hydrocarbon.

(c) Draw its electron dot structure.

(d) Name the alcohol which on heating with conc. H_2SO_4 will produce the above hydrocarbon C_xH_y .

OR

(a) With the help of diagram, show the formation of micelles, when soap is applied on oily dirt.

(b) Take two test tubes X and Y with 10 mL of hard water in each. In test tube 'X', add few drops of soap solution and in test tube Y add a few drops of detergent solution. Shake both the test tubes for the same period.

(i) In which test tube the formation of foam will be more ? Why?

(ii) In which test tube is a curdy solid formed? Why?

SECTION-C

(PHYSICS)

30. In a car headlamp a concave mirror of focal length 25 cm used. If the bulb filament is shifted 2 cm forward (towards the mirror) from the focus, what will happen to the nature of the reflected beam? 1

(a) The beam becomes parallel.

(b) The beam converges.

(c) The beam diverges slightly.

(d) The beam intensity decreases but remains parallel.

31. A copper wire and a nichrome wire of equal length and area are connected in series across the same voltage. Which statement is correct about current and heat produced per unit time? 1

(a) Same current; heat more in nichrome.

(b) Current higher in copper; heat more in copper.

(c) Current same; heat more in copper.

(d) Current same; heat equal in both.

The following two questions consist of two statements. Assertion (A) and Reason (R). Answer these questions by 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.

32. **Assertion (A) :** When the object moves from infinity towards a concave mirror, the image first forms at the focus, then moves from focus to centre of curvature, and finally behind the mirror. 1

Reason (R) : As the object distance decreases, the image distance increases in the same direction.

- 33.** A convex lens of focal length 20 cm forms an image of a candle at a distance 60 cm on the opposite side of the lens. 2
 (a) Find the position of the candle. (b) What is the magnification of the image?
 (Take distances from the optical centre.)

- 34.** A student claims: 2
 "When a current-carrying conductor is placed in a magnetic field, the direction of force is reversed if either the current or magnetic field direction is reversed, but not both."
 Is the statement correct? Justify your answer with Fleming's Left-Hand Rule.

OR

Absolute Refractive Index of some material media are given below. In which of these light travels fastest and why?

Medium	Kerosene	Diamond	Water	Turpentine
Refractive Index	1.44	2.42	1.33	1.47

- 35.** A student observes that while swimming underwater, objects appear closer and larger than they actually are. 3
 (i) Explain this observation using the concept of refraction of light.
 (ii) The student tries to touch a coin lying at the bottom of the pool but always misses the exact spot. Explain scientifically why this happens.
 (iii) If instead of water, the pool was filled with a liquid having a higher refractive index, how would the apparent position of the coin change?
- 36.** Draw a schematic diagram of a circuit consisting of a battery of three cells of 2V each, a 5Ω resistor, an 8Ω resistor, and a 12Ω resistor, and a plug key, all connected in series. Connect an ammeter to measure the current through the resistors and a voltmeter to measure the potential difference across the 12Ω resistor. What would be the readings in the ammeter and the voltmeter? 3
- 37.** During a school trip, students notice that the sky appears reddish during sunrise and sunset, while at noon it looks bluish. Their teacher relates this observation to the concept of scattering of light. 3
 (i) Why does the sky appear reddish during sunrise or sunset?
 (ii) Why does the sky appear blue at noon?
 (iii) How would the appearance of the sky change if the Earth had no atmosphere?
- 38.** An experiment is performed to study the dependence of current on potential difference for a conductor. The following readings are obtained: 1 + 1 + 2 = 4

Potential Difference (V)	1	2	3	4	5
Current (I) (A)	0.1	0.19	0.3	0.4	0.49

Questions:

- (a) Plot V-I graph and state its nature.
 (b) From the slope, find resistance of the conductor.
Attempt either (c) or (d)
 (c) Explain any two possible reasons if the graph does not pass through the origin.
OR
 (d) Which law does this experiment verify? State it.

39. Attempt either (A) or (B)

5

(A) A student connects a current-carrying circular coil to a battery and places a small magnetic compass at the center of the coil.

(i) What will the compass needle indicate when current starts flowing through the coil? 1

(ii) What factors affect the strength of the magnetic field produced at the center of the coil? 1

(iii) The student increases the number of turns of the coil without changing the current. Explain the effect on the magnetic field at the center. 1

(iv) Draw a diagram of the circular coil showing the magnetic field lines around it. 2

OR

(B) (i) Out of 60W and 40W lamps, which one has higher electrical resistance when in use with same Potential difference? 1

(ii) What is the commercial unit of electrical energy? convert it into Joules. 2

(iii) What is the ratio of equivalent resistance of series combination of n resistors to the equivalent resistance in parallel combination of these n resistors? 2

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