Sample Paper 07

Class X 2026-27

Science (086)

Time: 3 Hours **Max. Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
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.

SECTION-A

1. The stomach plays a crucial role in digestion by secreting hydrochloric acid (HCl). What is the primary function of HCl in the stomach?
(a) To break down fats into smaller droplets.
(b) To create an acidic medium for pepsin to act and to kill germs.
(c) To neutralize the acidity of the food coming from the mouth.
(d) To protect the stomach lining from digestive enzymes.

2. The axon of many neurons is covered by an insulating fatty layer. What is this layer called and what is its main function?
(a) Synapse; to release neurotransmitters.
(b) Dendrite; to receive nerve impulses.
(c) Myelin sheath; to speed up nerve impulse transmission.
(d) Cell body; to process information.

3. Regeneration is a method of asexual reproduction where an organism can regrow into a complete individual from a fragmented body part. This ability is most prominently seen in which of the following organisms?
(a) Yeast (b) Amoeba
(c) Rhizopus (d) Planaria

4. Charles Darwin's theory of natural selection is a cornerstone of modern biology. What is the central concept of this theory?
(a) That characteristics acquired during an organism's lifetime are inherited.
(b) That organisms with traits best suited to their environment tend to survive and reproduce more successfully.
(c) That evolution occurs through sudden and large-scale genetic mutations.
(d) That all species were created in their current form and do not undergo change.

5. In nature, feeding relationships are complex and interconnected, rather than simple linear chains. What term describes this network of multiple interconnected food chains in an ecosystem?
(a) Trophic level (b) Ecological pyramid
(c) Food web (d) Biomass

Continue on next page.....

6. Consider the following statements about the human endocrine system: (i) The pituitary gland is called the 'master gland' as it regulates the activity of many other endocrine glands. (ii) Insulin, a hormone that regulates blood sugar, is secreted by the thyroid gland. (iii) Adrenaline is secreted by the adrenal glands to prepare the body for emergency situations. (iv) Oestrogen is the primary male sex hormone.
Which of the above statements are correct?
(a) (i) and (iii) (b) (ii) and (iv)
(c) (i), (ii), and (iii) (d) All are correct.

7. The diaphragm is a large muscle situated below the lungs. What is its role during the process of inhalation (breathing in)?
(a) It relaxes and moves up, decreasing the volume of the chest cavity.
(b) It contracts and moves down, increasing the volume of the chest cavity.
(c) It remains stationary to support the lungs.
(d) It partially digests the air entering the lungs.

8. **Assertion (A) :** Veins have valves within them, but arteries do not.
Reason (R) : Blood in veins flows under low pressure and against gravity, so valves are needed to prevent backflow.
(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.

9. **Assertion (a) :** Damage to the Earth's ozone layer is a significant environmental concern.
Reason (R) : A depleted ozone layer allows less harmful ultraviolet (UV) radiation to reach the Earth's surface.
(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.

10. A student sets up an experiment by covering a part of a leaf of a destarched potted plant with a strip of black paper. After exposing the plant to sunlight for a few hours, the covered part of the leaf tests negative for iodine, while the uncovered part tests positive. What can be concluded from this experiment?

11. Student to attempt either option A or B.
A. How is the structure of the small intestine adapted for the efficient absorption of digested food? Mention any two structural features.

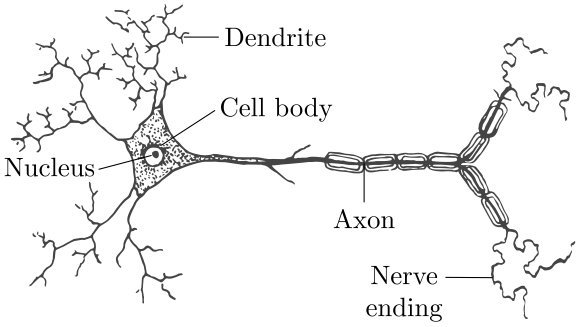
OR

B. What are the final, simplest products formed after the complete digestion of
(i) carbohydrates,
(ii) proteins, and
(iii) fats?

12. Differentiate between biodegradable and non-biodegradable wastes, giving one example of each. Which of the two poses a more serious threat to the environment and why?

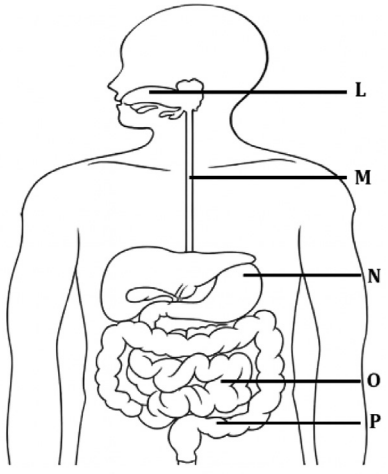
Continue on next page.....

13. Draw a neat diagram of a neuron and label the following parts:
(i) Dendrite
(ii) Axon
(iii) Cell Body



14. How are fossils formed? Describe one method of determining the age of a fossil.

15. Refer to the diagram of the human alimentary canal to the questions that follow.



Human Alimentary canal

A. A person consumes a diet rich in proteins. In which part of the alimentary canal (labelled N, O, P) does the digestion of protein begin? Name the enzyme that initiates this process.

OR

B. List two functions of the hydrochloric acid secreted in the part labelled 'N' (stomach).
C. What is the role of the part labelled 'O' (small intestine) in the digestion of fats? Explain the process of emulsification.

16. Attempt either option A or B
A. (i) Define budding and provide an example of a unicellular organism that reproduces this way.
(ii) How does regeneration in Planaria differ from the regeneration of a lizard's tail?
(iii) State one major advantage of sexual reproduction over asexual reproduction.

OR

B. (i) What are Sexually Transmitted Diseases (STDs)?
(ii) Name one STD caused by a bacterium and one caused by a virus.
(iii) Suggest two practices that can help in preventing the transmission of such diseases.

SECTION-B

17. In the reaction: $2AgNO_3(aq) + Cu(s) \rightarrow Cu(NO_3)_2(aq) + 2Ag(s)$ The oxidizing agent is:
(a) Cu(s) (b) Ag(s)
(c) $Cu(NO_3)_2(aq)$ (d) $AgNO_3(aq)$

18. Which of the following acids is naturally present in tomatoes?
(a) Acetic acid (b) Oxalic acid
(c) Citric acid (d) Lactic acid

19. Which is the most abundant metal found in the Earth's crust?
(a) Iron (b) Copper
(c) Aluminium (d) Calcium

20. Red cabbage extract is a natural acid-base indicator. What colour does it exhibit in a basic solution like soap water?
(a) Remains reddish-purple (b) Turns bright pink or red
(c) Turns bluish-green or yellow (d) Becomes colourless

21. What change will occur to the pH of 1 litre of pure water (pH=7) when a few drops of concentrated hydrochloric acid are added?
(a) The pH will increase significantly. (b) The pH will remain exactly 7.
(c) The pH will decrease slightly. (d) The pH will decrease significantly.

22. When Plaster of Paris is mixed with the correct amount of water, it sets into a hard solid mass. This hard solid is chemically:
(a) Calcium Carbonate (b) Anhydrous Calcium Sulphate
(c) Slaked Lime (d) Gypsum

23. The process of respiration in living organisms is considered an exothermic reaction because:
(a) it takes place in the presence of oxygen.
(b) it involves the intake of food.
(c) energy is released during the breakdown of glucose.
(d) water is produced as a by-product.

24. **Assertion (A) :** The complete combustion of hydrocarbons like methane produces carbon dioxide and water.
Reason (R) : The incomplete combustion of hydrocarbons, in a limited supply of air, can produce carbon monoxide.
(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.

25. Answer the following based on exceptions to the general properties of elements:

(a) Name a metal that is a poor conductor of heat.

(b) Name a non-metal that has a very high melting point, comparable to that of strong metals.

26. Attempt either option A or B.

(A) Moderately reactive metals like Zinc are often found as sulphide ores. The extraction involves converting the ore to an oxide and then reducing it.

(i) What is the chemical formula of zinc blende, the sulphide ore of zinc?

(ii) Name the process used to convert zinc blende into zinc oxide and write its balanced chemical equation.

(iii) Name the substance commonly used to reduce zinc oxide to zinc metal.

OR

(B) Alloying is a very important process for creating materials with desired properties.

(i) What is meant by the term 'alloying'?

(ii) Name the main constituents of stainless steel.

(iii) State one key property of stainless steel that makes it suitable for manufacturing surgical instruments.

27. A student takes about 5 mL of distilled water in a beaker. She carefully adds a few pellets of solid sodium hydroxide (NaOH) to it and stirs the solution with a glass rod.

(a) If the student touches the outside of the beaker, what change in temperature will she observe?

(b) What does this observation indicate about the nature of the dissolution process of NaOH in water?

(c) Based on your conclusion in part (B), what safety precaution should be followed while preparing a dilute solution of a strong acid like sulphuric acid?

28. A student is given three unlabelled, colourless solutions: A (distilled water), B (an acid), and C (a base). She is provided only with a strip of red litmus paper.

(a) Describe the procedure she would use to identify solution C (the base).

(b) After identifying solution C, how can she use it and the original red litmus paper to identify solution B (the acid)?

(c) How will she finally identify solution A (distilled water)?

OR

The pH of a solution indicates its hydrogen ion concentration. Two acidic solutions, P and Q, have pH values of 4 and 1, respectively.

(a) Which of the two solutions, P or Q, is more acidic?

(b) The hydrogen ion concentration in the more acidic solution is how many times greater than in the less acidic solution?

(c) What would be the nature of a solution that has a pH of 14? What does this pH value indicate about its ion concentrations?

29. Attempt either option A or B.

(A) Ethanoic acid (CH_3COOH) is a carboxylic acid that shows several important chemical reactions.

(a) Write the balanced chemical equation for the reaction of ethanoic acid with:

(i) Sodium metal

(ii) A solution of Sodium Hydroxide

(iii) Solid Sodium Carbonate

(b) Why is pure ethanoic acid often called 'glacial acetic acid'?

(c) What is the common name for a 5-8% aqueous solution of ethanoic acid?

OR

(B) The unique nature of the carbon atom allows it to form a vast number of compounds.
(a) State two characteristic properties of carbon that are responsible for the large number of organic compounds we see around us.
(b) What are covalent bonds?
(c) Explain why covalent compounds generally have low melting and boiling points.
(d) Draw the electron dot structure for a molecule of carbon dioxide (CO_2).
(e) Explain why carbon dioxide gas is effective in extinguishing most types of fires.

SECTION-C

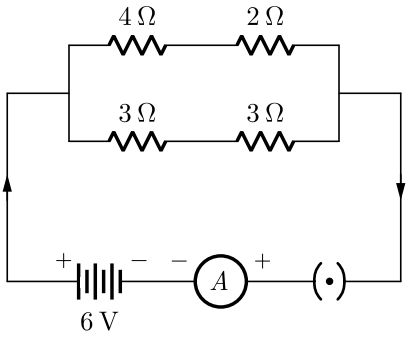
30. A student makes the following statements about the image formed by a concave mirror:
I. A concave mirror can form a real, inverted image.
II. A concave mirror can form a virtual, erect, and magnified image.
III. The image formed by a concave mirror is always real and inverted.
Choose from the following the correct option that lists the correct statements.
(a) I and II (b) I and III
(c) I, II and III (d) II and III

31. Which of the following phenomena is responsible for the formation of a rainbow in the sky?
(a) Reflection and dispersion (b) Refraction and reflection
(c) Dispersion, refraction, and total internal reflection (d) Dispersion and scattering

32. Assertion (A): The focal length of a concave mirror is considered to be negative.
Reason (R): According to the New Cartesian Sign Convention, the focal length of a concave mirror lies to the left of the mirror and distances in this direction are taken as negative.
(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.

33. A concave mirror of focal length 15 cm is used to obtain an erect image.
A. Explain the condition under which a concave mirror forms an erect and magnified image.
B. State the range of object distances for which this condition is satisfied.
C. Draw the ray diagram for this case.

34. Attempt either option A or B
A. n the given circuit, find :



(a) Total resistance of the network of resistors
(b) Current through ammeter A

OR

B. Study the given electric circuit and calculate:
(i) the current flowing through the $4\,\Omega$ resister and
(ii) potential difference across the combination of two resistor of $8\,\Omega$ each.

35. A child is able to read his book comfortably but is unable to read the matter written on the blackboard at certain distance.
(a) Name the defect of vision he is suffering from.
(b) With the help of labelled ray diagram show :
(i) The above mentioned defect of vision.
(ii) Correction of the above mentioned defect using a suitable lens.

36. In a household electric circuit different appliances are connected in parallel to one another. Give two advantages of such connections.
Two bulbs rated 100 W, 200 V and 25 W, 200 V are connected in parallel to a 200 V supply. What will be the current drawn from the supply line ?

37. A coil of insulated copper wire is connected to a galvanometer. What would happen if a bar magnet is :
(i) Pushed into the coil ?
(ii) Withdrawn from inside the coil ?
(iii) Held stationary inside the coil ?

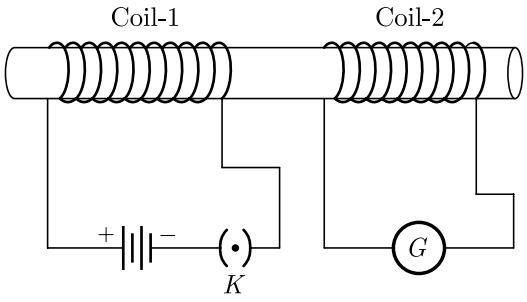
38. A simple viewer uses a concave lens to obtain a wide field of view. When an object is placed in front of a concave lens, the outgoing rays diverge as if they originate from a point on the same side of the lens. The image formed is always virtual, erect and diminished. Such lenses are also useful where reduction of image size is needed before further imaging.
A. Which lens is used in this viewer and what type of image does it form?
B. Can a single concave lens project a real image on a screen? Give a reason.
Attempt either subpart C or D.
C. For a concave lens of focal length $f = -15\text{cm}$, an object is placed at $u = -30\text{cm}$. Find the image distance v.

OR

D. For the same lens, calculate its power in dioptres and state the sign.

39. Attempt either option A or B
A. (i) With the help of an activity, explain the method of inducing electric current in a coil with a moving magnet. State the rule used to find the direction of electric current thus generated in the coil.
(ii) Two circular coils-1 and coil-2 are kept close to each other as shown in the diagram. Coil-1 is connected to a battery and key and coil-2 with a galvanometer. State your observation in the galvanometer:

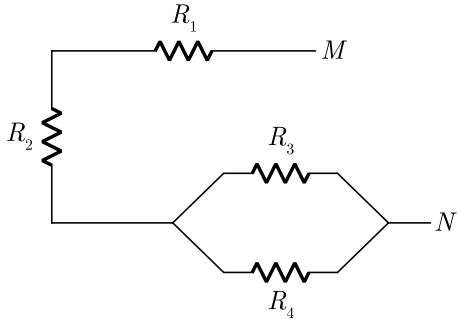
Continue on next page.....



(a) When key K closed;
(b) When key K is opened;
Give reason for your observations.

OR

B. (i) For the combination of resistors shown in the following figure, find the equivalent resistance between M and N:



(ii) State Joule's law of heating.
(iii) Why we need a 5A fuse for an electric iron which consumes 1 kW power at 220 V?
(iv) Why is it impracticable to connect an electric bulb and an electric heater in series?

****