

D.A.V. PUBLIC SCHOOL, AIROLI
FIRST TERM SAMPLE PAPER (2024-25)

Class X

Science (Subject Code – 086)

Max. Marks: 80

Time Allowed: 3 hours

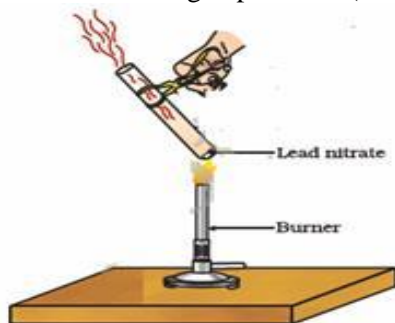
General Instructions:

- 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

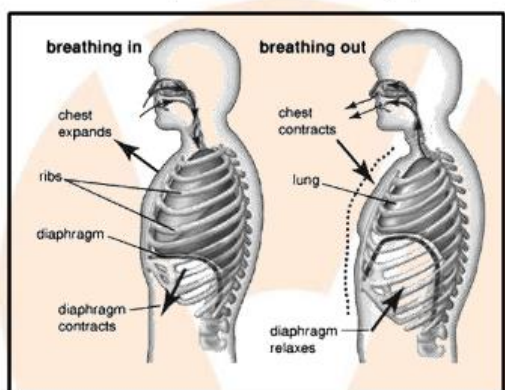
Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

1. Identify the brown gas formed in the following experiment (heating of lead nitrate).

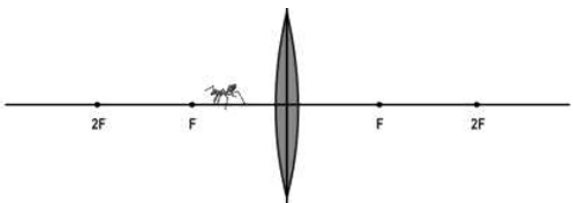


- (a) H₂ (b) CO₂ (c) NO₂ (d) SO₂
2. A base used in the manufacture of soap is
- (a) Calcium hydroxide (b) Sodium hydroxide
(c) Ammonium hydroxide (d) Zinc hydroxide
3. An aqueous solution of a salt turns red litmus to blue. The salt could be obtained by the reaction of:
- (a) HCl and KOH (b) H₂SO₄ and NaOH
(c) HCl and Ca(OH)₂ (d) H₂CO₃ and NaOH
4. Which of the following statements about the given reaction are correct?
- $$3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$$
- (i) Iron metal is getting oxidised.
(ii) Water is getting reduced.
(iii) Water is the oxidising agent.
(iv) Iron is the oxidising agent.
- (a) (i) and (ii) (b) (i), (ii) and (iii) (c) (i), (ii) and (iv) (d) (iii) and (iv)
5. Which of the following salts does not contain water of crystallisation?
- (a) Baking soda (b) Washing soda (c) Gypsum (d) Plaster of Paris
6. The correct pair of salt solutions to demonstrate double displacement reaction is:
- (a) Barium sulphate and Sodium chloride (b) Barium chloride and Sodium sulphate
(c) Barium sulphate and Sodium sulphate (d) Barium chloride and Sodium chloride.

7. Which of the following statements is correct about an aqueous solution of an acid and of a base?
- (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
- (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)
8. The concentration of water and ions in our body is maintained by the process of
- (a) Osmoregulation (b) digestion (c) circulation (d) respiration
9. In which of the following vertebrate group/groups heart does not pump oxygenated blood to different parts of the body?
- (a) Pisces and Amphibians (b) Amphibians and Reptiles (c) Amphibians only (d) Pisces only
10. Gland entirely responsible for calcium metabolism is
- (a) Thymus (b) Thyroid (c) Parathyroid (d) Adrenal
11. The maximum volume of air contained in the lung by a full forced inhalation is called _____.
- (a) Tidal volume (b) Vital capacity (c) Ventilation rate (d) Total lung capacity



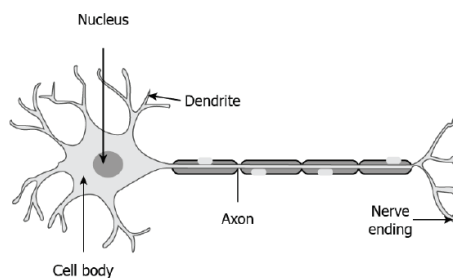
12. Which parts of the brain control blood pressure?
- (a) Spinal cord, skull, hypothalamus
 - (b) Cord, skull, cerebrum
 - (c) Pons, medulla, cerebellum
 - (d) Pons, medulla, pituitary
13. An ant was in front of a convex lens as shown below.



Which of the following shows the image of the ant observed through the convex lens?

- A.
- B.
- C.
- D.

14. The lens system of human eye forms an image on its light sensitive screen, which is called
 (a) cornea (b) ciliary muscles (c) optic nerve (d) retina
15. The image shows the structure of a neuron.



- Which of the following options shows the mechanism of the travelling of sense in our body after our nose senses a smell?
- (a) Olfactory receptors → dendritic tip of a nerve cell → axon → nerve ending → release of the signal dendritic tip of another nerve cell
- (b) Olfactory receptors → dendritic tip of a nerve cell → axon → cell body → release of signal → dendritic tip of other nerve cell
- (c) Gustatory receptors → dendritic tip of a nerve cell → cell body → axon → release of the signal dendritic tip of another nerve cell
- (d) Gustatory receptors → dendritic tip of a nerve cell → axon → cell body → release of the signal dendritic tip of another nerve cell
16. When we touch the leaves of the “touch-me-not” plant, they begin to fold up and droop. How does the plant communicate the information of touch?
- (a) The plant uses electrical signals to transfer information from the external environment to cells.
- (b) The plant uses electrical-chemical signals to transfer information from cell to cell.
- (c) The plant uses electrical-chemical signals to transfer information from tissue to specialised cells.
- (d) The plant uses electrical signals to transfer information from cells to specialised tissues.

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions 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.

17. **Assertion (A):** During dilution of an acid, water must be added slowly to acid with constant stirring.
Reason(R): The process of dissolving acid in water is highly exothermic
18. **Assertion (A):** Valves are present in the arteries.
Reason (R): Arteries carry oxygenated blood from heart to different body parts except pulmonary artery.
19. **Assertion (A):** Stars would not twinkle if we viewed them from the moon.
Reason (R): Stars appear to twinkle due to atmospheric refraction of starlight.
20. **Assertion (A):** Food chain is responsible for the entry of harmful chemicals in our bodies.
Reason(R): The length and complexity of food chains vary greatly.

Section-B

Question No. 21 to 26 are very short answer questions

21. Compound X when dissolved in water gives compound Y and liberates heat. Compound X is used in whitewashing. A solution of compound Y react with CO₂ to form a white precipitate of compound Z. Identify compounds X and Y. Also write the chemical equation for the reaction of Y and CO₂ to form Z.

22. Name the plant hormones responsible for the following:
 (a) elongation of cells (b) growth of stem (c) promotion of cell division (d) falling of leaves
23. (a) Mention any two components of blood.
 (b) Write the structural difference between the composition of artery and veins.

OR

- In birds and mammals, the left and right side of the heart are separated. Give reasons.
24. A cube of edge 6 cm is placed over a printed page. At what distance from the top surface of cube will the letters appear when seen from above? Refractive index of glass is 1.5.
25. Explain what happens when human eye focuses: (a) nearby objects and (b) distant objects.
26. Why does the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron take place but not in the reverse direction? Explain.

Section-C

Question No. 27 to 33 are short answer questions

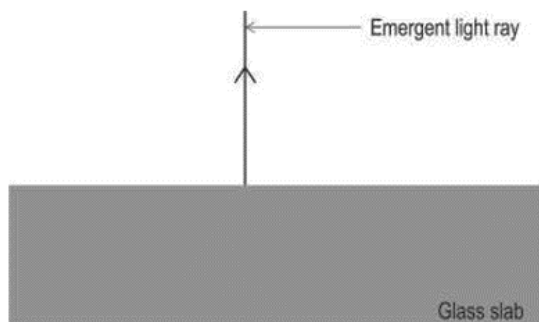
27. (a) Give an example (balanced chemical equation) of a combination reaction which is exothermic.
 (b) Identify oxidising agent and reducing agent in the following reaction.

$$\text{H}_2\text{S} + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{S}$$

 (c) Name the phenomenon due to which the taste and smell of food changes when kept for a long time in open. Suggest one method to prevent it.
28. (a) A first aid manual suggests that vinegar should be used to treat wasp sting and baking soda for bee stings.
 (i) What does this information tell you about the chemical nature of wasp sting and bee sting?
 (ii) If there is no vinegar in the house, what other house hold substance would you use to treat wasp stings?
 (b) A few drops of phenolphthalein indicator were added to an unknown solution P. It acquired pink colour. Now another unknown solution Q was added to it drop by drop and the solution becomes colourless. Predict the pH of P and Q.

OR

- What is the chemical name of bleaching powder? By using suitable chemical equations, show that common salt is a raw material for the preparation of bleaching powder.
29. (a) Name one gustatory receptor and one olfactory receptor in human beings.
 (b) Trace the sequence of events which occur in our body when a bright light is focussed on your eyes.
30. (a) What is the role of gall bladder in human body?
 (b) What happened if gall bladder is removed?
 (c) What is the function of bile salt in the intestine?
31. The ray of light emerging from a rectangular glass slab into air is shown in the diagram below.



- Copy the diagram and draw the path of the same light ray as it enters from air and passes through the glass slab.
32. Draw a ray diagram to show the formation of a rainbow in the sky. On this diagram mark A- where dispersion of light occurs, B- where internal reflection of light occurs and C- where refraction of light occurs. List two necessary conditions to observe a rainbow.

33. A 2 cm high object is placed at a distance of 32 cm from a convex lens. The image is real, inverted and 3 cm in size. Find the focal length of the lens and the position where the image is formed?

OR

A concave lens has a power of -2.0D. It forms an image of an object at a distance of 10 cm from the lens.

- (a) Find the distance of the object from the lens.
(b) Find the magnification produced.

Section-D

Question No. 34 to 36 are long answer questions.

34. (a) Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.

- (i) Nitrogen gas treated with hydrogen gas to form ammonia gas.
(ii) Sodium hydroxide solution is treated with acetic acid to form sodium acetate and water.

- (b) List four important observations that help us to determine that a chemical reaction has taken place.

OR

- (a) Can a displacement reaction be a redox reaction? Explain with an example.
(b) Write all your observations when the following substances are heated strongly in a test tube.

- (i) Ferrous sulphate crystals (ii) Lead nitrate crystals

35. (a) Why does lack of oxygen in muscles often lead to cramps among cricketers?
(b) Why is nutrition necessary for the human body?
(c) What will happen if the mucus is not secreted by the gastric glands?
(d) Mention the role of acid in the stomach.

OR

- (a) Name the components of the transport system in organised plants.
(b) How are water and minerals transported in plants?
(c) How is food transported in plants?

36. A child while playing with his father's spectacles burnt a hole in a piece of paper by focusing a small image of the sun on it.

- (a) What defect of vision his father is suffering from?
(b) Write two causes for this defect?
(c) Draw a ray diagram to show image formation by the defective eye?
(d) Draw a ray diagram showing corrected eye using proper lens.

OR

- (a) Rupal suffers from myopia. Where would the image form in her eye?
(b) Name the type of lens that is generally used to correct myopia. Draw a ray diagram showing corrected eye using proper lens.
(c) Rupal underwent cataract surgery and her eye lens was replaced with an artificial lens with a fixed focal length, made of a plastic material, silicone. State one likely visual disadvantage that Rupal is likely to experience as compared to a person who has normal eyesight.

SECTION - E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts.

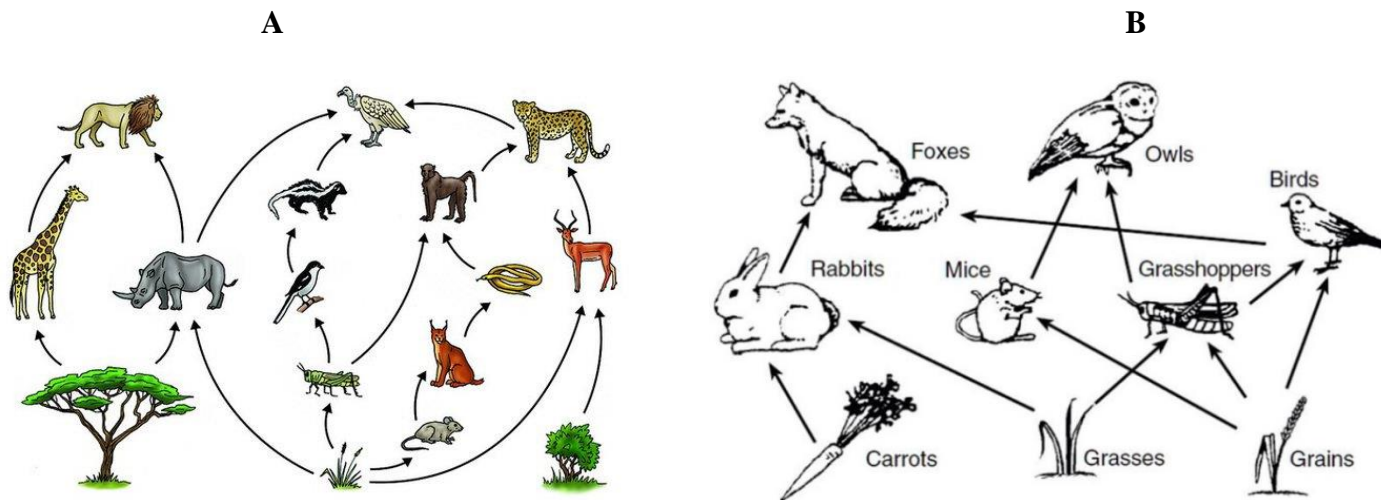
Internal choice is provided in one of these sub-parts.

37. (a) You have four solutions A, B, C and D having pH 4, 9, 12 and 7 respectively.
(i) Identify the most acidic and most basic solutions.
(ii) Arrange the above four solutions in the increasing order of H^+ ion concentrations.
(b) Why does a stain of curry on a white cloth become reddish brown when soap is scrubbed on it and turns yellow again when the cloth is washed with plenty of water?

OR

- (b) How is tooth decay related to pH? How it can be prevented?

38. An ecosystem that retains a high biodiversity is more likely to adapt to human caused environmental changes than the one that shows low biodiversity. A food web is the interconnected food chains operating in an ecosystem which establishes a network of relationships between various species. Consider the two food webs shown in the diagrams A and B.



- (a) From Food webs A and B find out which two of the organisms belongs to same trophic level.
- (b) In comparison of two ecosystems, it was observed that ecosystem A has third order consumer, while ecosystem B has only first and second order consumers. Which of the two is more stable?
- (c) Write any two difference between food chain and food web.

OR

- (c) (i) Why are the pyramids of number and energy always upright?
- (ii) What will happen if deer is missing in the food chain given below?



39. Study the data given below showing the focal length of three concave mirrors 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

- (a) In which one of the above cases the mirror will form a diminished image of the object? Justify your answer. (1)
- (b) List two properties of the image formed in case 2. (1)
- (c) What is the nature and size of the image formed by mirror C? Draw ray diagram to justify your answer. (2)

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. (2)