



# PRINCE ACADEMY

OF HIGHER EDUCATION

[Co-edu. Sr. Sec. School, Affiliated to CBSE, Affiliation No. - 1730387]

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## SAMPLE PAPER 2024-25

CLASS - X

Time : 03 : 00 Hours

SCIENCE (086)

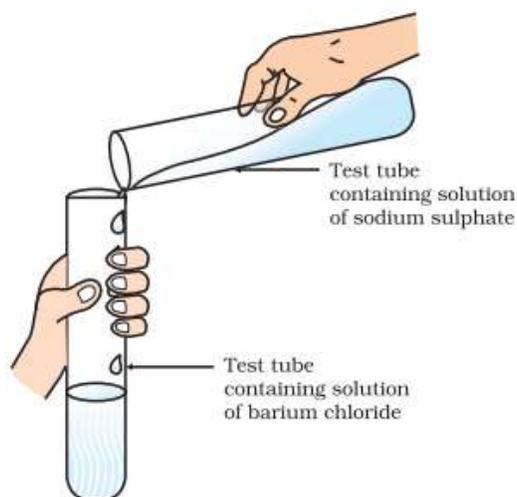
M. M. : 80

### General Instructions :

1. This question paper consists of 39 questions in 5 sections.
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.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. 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.
5. 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.
6. 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.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

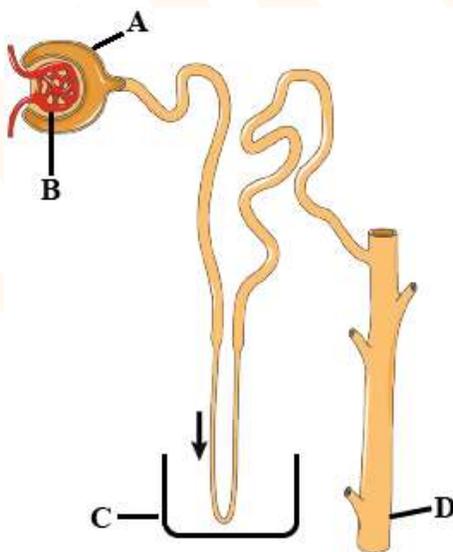
### SECTION - A

1. Which of the following statement is incorrect about the electrolysis of water?
  - (a) Electrodes are made of graphite
  - (b) At cathode hydrogen gas evolves
  - (c) At anode hydrogen gas evolves
  - (d) A few drops of sulphuric acid is added to increase the conductivity of water
2. 3 ml sodium sulphate solution is added with 3 ml barium chloride solution in a test tube. What is incorrect about the reaction?



- (a) It is a double displacement reaction.
- (b) It involves exchange of ions.
- (c) It is a precipitation reaction.
- (d) Yellow precipitate of barium sulphate is formed.

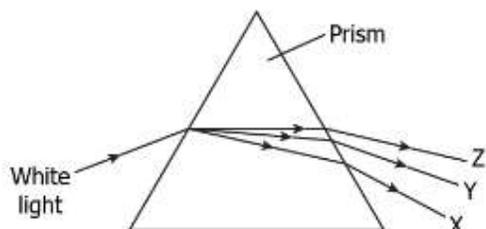
3. In which solution onion will lose its odour :  
 (a) NaOH                      (b) NaCl                      (c) HCl                      (d) CH<sub>3</sub>COOH
4. Which of the following represent 'Milk of Magnesia'?  
 (a) NaOH                      (b) KOH                      (c) Mg(OH)<sub>2</sub>                      (d) NH<sub>4</sub>OH
5. Which of the following pair of metals are poor conductor of heat?  
 (a) Pb and Cu                      (b) Zn and Al                      (c) Zn and Pb                      (d) Pb and Hg
6. The metal which does not react with water at all is :  
 (a) Gold                      (b) Copper                      (c) Lead                      (d) All of these
7. Which of the following carbon compounds will give substitution reaction :  
 (a) CH<sub>4</sub>                      (b) C<sub>2</sub>H<sub>4</sub>                      (c) C<sub>3</sub>H<sub>6</sub>                      (d) C<sub>4</sub>H<sub>8</sub>
8. Person suffering from cataract has :  
 (a) elongated eyeball                      (b) excessive curvature of eye lens  
 (c) weakened ciliary muscles                      (d) opaque eye lens
9. In the given diagram of nephron, identify the part where reabsorption of excess water from filtrate occurs



- (a) A                      (b) B                      (c) C                      (d) D
10. The plant hormone which involves in the growth of tendril is-  
 (a) cytokinin                      (b) gibberellin                      (c) Auxin                      (d) Abscisic acid
11. 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?  
 (a) Regeneration                      (b) Budding  
 (c) Vegetative propagation                      (d) Sexual reproduction
12. Two pea plants one with round-green seeds (RRyy) and another with wrinkled - yellow seeds (rrYY) produce F<sub>1</sub> progeny that have round yellow seeds (RrYy). When F<sub>1</sub> plants are self pollinated, the F<sub>2</sub> progeny will have new combinations of characters.  
 Choose the new combinations from the following :  
 (i) Round, Yellow                      (ii) Round, Green                      (iii) Wrinkled, Yellow                      (iv) Wrinkled, Green  
 Option :-  
 (a) (i) and (ii)                      (b) (ii) and (iii)                      (c) (i) and (iv)                      (d) (i) and (iii)

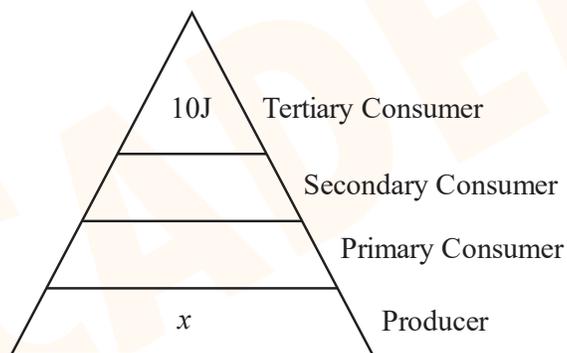
13. The image of the distant object is obtained on a screen by using a concave mirror. The focal length of the mirror can be determined by measuring the distance between -
- the object and the mirror
  - the object and the screen
  - the mirror and the screen
  - the mirror and the screen as well as that between the object and the screen

14. The image shows dispersion of the white light in the prism.



What will be the colours of the X, Y and Z?

- X : Green, Y : Violet, Z : Red
  - X : Violet, Y : Green, Z : Red
  - X : Red, Y : Violet, Z : Green
  - X : Red, Y : Green, Z : Violet
15. The maximum resistance which can be made using four resistors each of resistance  $\frac{1}{2}\Omega$  is :
- $2\Omega$
  - $1\Omega$
  - $2.5\Omega$
  - $8\Omega$
16. In the given diagram of food pyramid of energy, the value of x is :



- 10 J
- 10,000 J
- 1,000 J
- 1 J

**Q. Nos. 17 to 20 are Assertion - Reasoning based questions.**

These consists of two statements Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below.

- Both (A) and (R) are true and (R) is the correct explanation of (A).
- Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (A) is true but (R) is false.
- (A) is false but (R) is true.

17. **Assertion (A):** After white washing the walls, a shiny white finish on walls is obtained after two or three days.  
**Reason (R):** Calcium oxide reacts with Carbon dioxide to form calcium hydrogen Carbonate which gives shiny white finish.
18. **Assertion (A):** Insufficient secretion of insulin will cause diabetes.  
**Reason (R):** Insulin regulates blood sugar level.
19. **Assertion (A):** In a cross experiment two pea plants are crossed due to which 50% tall and 50% dwarf plants are obtained in  $F_1$ .  
**Reason (R):** One plant was heterozygous tall and the other was dwarf.
20. **Assertion (A):** Copper metal is used for making filaments of electric lamps.  
**Reason (R):** Copper is a good conductor of heat and electricity.

### SECTION - B

21. A shiny brown coloured element 'X' on heating in air becomes black in colour. Name the element 'X' and black coloured compound formed. Write the balanced chemical equation of the reaction taking place.

OR

Write the balanced chemical equation for the following :

- (i) Nitrogen and hydrogen combines to produce ammonia.
- (ii) Hydrogen sulphide gas burn in air to give water and sulphur dioxide. 1+1=2
22. When a metal reacts with an acid 'X' then hydrogen gas is not evolved. Name the acid 'X' and explain why is it so? 1+1=2
23. Why is copper used to make hot water tanks and not steel? Explain. 2
24. Write the IUPAC name of the following carbon compounds :  $\frac{1}{4} \times 4 = 2$
- (i)  $\text{CH}_3\text{-CH}_2\text{-Br}$       (ii)  $\text{H-CHO}$       (iii)  $\text{CH}_3\text{-CH}_2\text{-OH}$       (iv)  $\text{CH}_3\text{-CH=CH}_2$
25. Barrier method is considered as the best contraceptive method. Give two reasons.

OR

- State two differences between germ cells (gamete) and Zygote. 2
26. "Variations help to survive better." Justify. 2

### SECTION - C

27. (a) State two differences between plasma and lymph.  
 (b) Trace the path to show the flow of lymph from intercellular spaces back into the blood. 2+1=3
28. Draw a diagram of neuron and label the following parts in the diagram :
- (i) Where information is acquired.  
 (ii) Through which information travels as an electrical impulse.  
 (iii) Where this impulse must be converted into a chemical signal for onward transmission.  $1\frac{1}{2}+1\frac{1}{2}=3$
29. (i) State snell's law of refraction of light. In which situation is this law true?  
 (ii) When a ray of light travelling in air enters obliquely into a glass slab, it is observed that the light ray emerges parallel to the incident ray but it is shifted sideways slightly. Draw a labelled diagram to illustrate it.  $1\frac{1}{2}+1\frac{1}{2}=3$

OR

- (i) State two properties of image formed by plane mirror.  
 (ii) What does happen when a light ray incident perpendicularly to the surface of a plane mirror. Explain. 1+2=3

30. A student wants to project the image of a candle flame on a screen placed at 80 cm in front of a mirror by keeping the candle flame at a distance of 20 cm from its pole.
- (i) Which type of mirror should the student use?  
(ii) Find the magnification of the image produced.  
(iii) Draw a ray diagram to show the image formation in this case. 1+1+1=3
31. (i) State the function of the following parts of human eye :  
(A) Iris (B) Ciliary muscles  
(ii) What is meant by power of accommodation of the eye?

**OR**

- (i) What do you mean by scattering of light? How does scattering of light depend on the size of particles?  
(ii) Why does sky appear blue? 2+1=3
32. (a) Draw the pattern of magnetic field lines due to current carrying circular loop.  
(b) If a current carrying circular coil having  $n$  turns, then the magnetic field produced is  $n$  times larger than that produced by a single turn. Why? 2+1=3
33. (a) Why do plants have low energy needs?  
(b) Differentiate transpiration and translocation.  
(c) Name the two waste products in plants which are stored in old xylem. 1+1+1=3

**SECTION - D**

34. The formulae of four organic compounds are given below :
- |          |            |            |          |
|----------|------------|------------|----------|
| A        | B          | C          | D        |
| $C_2H_4$ | $CH_3COOH$ | $C_2H_5OH$ | $C_2H_6$ |
- (i) Which one of these compounds A, B, C or D is a saturated hydrocarbon?  
(ii) Identify the organic acid and write its structure.  
(iii) Which of the above compounds when heated at 443K in the presence of concentrated  $H_2SO_4$  forms ethene as the major product? What is the role played by concentrated  $H_2SO_4$  in this reaction? Also write the chemical equation of the reaction.  
(iv) How can A be converted into D. Write chemical equation of the reaction.  $\frac{1}{2}+1+2+1\frac{1}{2}=5$

**OR**

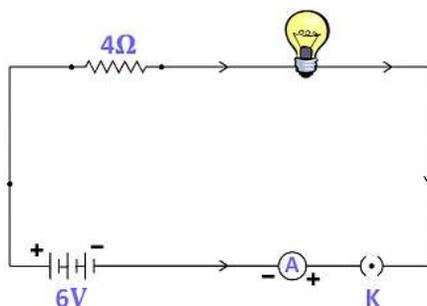
Write the chemical formula and name of the compound which is the active ingredient of all alcoholic drinks. List its two uses. Write chemical equation and name of product formed when this compound is heated with :

- (i) Sodium metal (ii) Hot concentrated sulphuric acid. 1+1+3=5
35. (i) Hydra can reproduce by both budding and regeneration but in different ways. State two differences in these two methods used by hydra.  
(ii) Explain the process of budding in hydra with the help of labelled diagram. 2+3=5

**OR**

- (i) Draw the diagram of human female reproductive system and label the following parts where :  
(A) Fertilisation takes place. (B) Egg is produced.  
(C) Embryo develops into new young one.  
(ii) Write the structure and functions of placenta. 3+2=5

36. A bulb is rated 40W; 220V. Find current drawn by it, when it is connected to a 220V supply. Also find its resistance. If the given bulb is replaced by a bulb of rating 25W; 220V, will there be any change in the value of current and resistance? Justify your answer and determine the change. 1+1+1+1+1=5



**OR**

An electric lamp of resistance 20W and a conductor of resistance 4W are connected to a 6V battery as shown in the circuit. Calculate :

- (i) The total resistance of the circuit.  
 (ii) The current through the circuit.  
 (iii) The potential difference across the :

(a) electric lamp

(b) conductor

(iv) Power of electric lamp.

1+1+2+1=5

**SECTION - E**

37. Read the following and answer questions :

The Teacher while conducting practicals in the laboratory divided the students into three groups and gave them various solutions to find out their pH and classify them into acidic, basic and neutral solutions.

Group A : Lemon Juice, Vinegar, Colourless Aerated Drink.

Group B : Tomato Juice, Coffee, Ginger Juice.

Group C : Sodium Hydroxide, Sodium Chloride, Lime Water.

- (a) For the solutions provided, which group is/are likely to have pH value :  
 (i) less than 7 (ii) greater than 7  
 (b) List two ways to determining pH of a solution.  
 (c) Explain, why the sour substance such as lemon juice are effective in cleaning the tarnished copper vessels.

**OR**

“pH has great importance in our daily life.” Justify this statement by giving two examples. 1+1+2=4

38. Read the following and answer questions :

In trains plastic cups were used to serve tea for reasons of hygiene. But later Kulhads, that is made of clay were used as alternative of plastic cups. Again, after few years kulhads were also replaced by paper cups which are found suitable for environment.

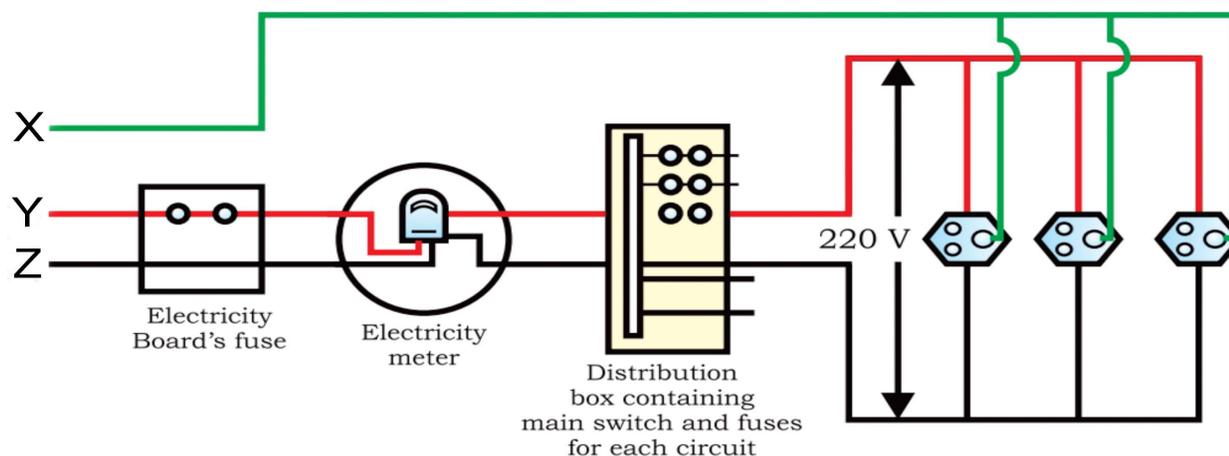
- (a) Out of plastic cups and paper cups, which is biodegradable and non-biodegradable.  
 (b) Why does the use of paper cups suitable for environment?  
 (c) Why is the use of plastic cups not in the favour of environment? State two reasons.

**OR**

Kulhads are made of clay then why their use is not in the favour of environment.

1+1+2=4

39. Study the given schematic diagram of the common domestic circuit and answer the questions:-



- (a) Identify the wire which is live and neutral respectively. 1
- (b) Which wire is an earth wire? State its role in the circuit. 1
- (c) What do you mean by overloading? State its two causes. 2

OR

An electric oven of 2 kW power rating is operated in a domestic electric circuit (220 V) that has a current rating of 5 A. What result do you expect? Explain. 2

\* \* \* \* \*

**ROUGH WORK**

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