

SPECTRA PRACTICE PAPER(2024-25)

SPECTRA CLASSES

CLASS – 10TH

SUBJECT – SCIENCE

TIME – 3 HR.

MM: 80

General Instruction:

1. This question paper consists of 38 questions. All questions are compulsory.
2. This question paper is divided into five Sections - A, B, C, D and E.
3. Section A Question numbers 1 to 18 are multiple choice questions (MCQs) and questions numbers 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. Section B, Question numbers 21 to 26 are very short answer (VSA) type questions. Carrying 2 marks each.
5. Section C, Question numbers 27 to 33 are short answer (SA) type questions. Carrying 3 marks each..
6. Section D, Question numbers 34 and 36 are long answer (LA) type questions. Carrying 5 marks each.
7. Section E, Question numbers 37 and 39 are case-study based integrated question carrying 4 marks each.
9. Draw neat diagrams wherever required. .
10. Use of calculators is NOT allowed.

SECTION - A

1. Which among the following is (are) double displacement reaction(s)?

- (i) $\text{Pb} + \text{CuCl}_2 \rightarrow \text{PbCl}_2 + \text{Cu}$
- (ii) $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$
- (iii) $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$
- (iv) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

- (a) (iii) and (iv) (b) (ii) only (c) (i) and (ii) (d) (i) and (iv)

2. Two colourless solutions X and Y were mixed together. On mixing, a yellow precipitate Z was formed. Which of the following statements is correct regarding X, Y and Z?

- (a) X and Y were potassium hydroxide solution and nitric acid respectively and the yellow precipitate Z was potassium nitrate.
- (b) X and Y were sodium hydroxide solution and hydrochloric acid respectively and the yellow precipitate Z was sodium chloride.
- (c) X and Y were potassium chloride solution and water respectively. The yellow precipitate Z was of chloride ions.
- (d) X and Y were lead nitrate solution and potassium iodide solutions respectively. The yellow precipitate Z was lead iodide.

3. Identify the balanced chemical equation.

- (a) $\text{BaCl}_2 + 2\text{Al}_2(\text{SO}_4)_3 \rightarrow 2\text{AlCl}_3 + 3\text{BaSO}_4$
- (b) $3\text{BaCl}_2 + 2\text{Al}_2(\text{SO}_4)_3 \rightarrow 2\text{AlCl}_3 + 3\text{BaSO}_4$
- (c) $3\text{BaCl}_2 + \text{Al}_2(\text{SO}_4)_3 \rightarrow 2\text{AlCl}_3 + 3\text{BaSO}_4$
- (d) $\text{BaCl}_2 + \text{Al}_2(\text{SO}_4)_3 \rightarrow \text{AlCl}_3 + \text{BaSO}_4$

4. Four solutions P, Q, R and S have pH 2, 7, 9 and 13, respectively. Which of the solution will turn phenolphthalein pink?

- (a) R and S (b) S only (c) Q and S (d) P only

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- 5 . Sodium bicarbonate solution is added to dilute ethanoic acid. It is observed that
 (a) The mixture becomes light yellow (b) The mixture becomes warm
 (c) A solid settles at the bottom (d) A gas evolves
7. Dilute hydrochloric acid was added to solid sodium bicarbonate. It was observed that
 (a) A gas evolved with a pop sound
 (b) Brisk effervescence was produced
 (c) Solution colour is yellow
 (d) A gas evolved and a black residue appeared at the bottom of the test tube.
8. Latin name for royal water is X. It is a mixture of Y and Z in the ratio 3:1. Some of the properties of X are different from Y and Z. What are X, Y and Z respectively?
 (a) H_2SO_4 , H_2S , SO_3 (b) Aqua regia, HCl , HNO_3
 (b) (c) Aqua regia, HNO_3 , HCl (d) H_2SO_4 , H_2O , SO_2
9. Which of the following compounds contains carboxylic group?
 (a) $CH_3-CH_2-CH_3$ (b) CH_3-CH_2-COOH
 (c) $CH_3COOC_2H_5$ (d) CH_3CH_2OH
10. Temporary mount of a leaf peel is prepared in:
 (a) Dilute glycerine (b) 70% alcohol
 (c) Nail polish (d) Canada Balsam
11. In human beings, when the process of digestion is completed, the (i) proteins, (ii) carbohydrates, and (iii) fats are respectively finally converted into:
 (a) Sugars, (ii) amino acids, (iii) fatty acids and glycerol
 (b) Amino acids, (ii) glucose and (iii) fatty acids
 (c) Amino acids, (ii) glucose, (iii) fatty acids and glycerol
 (d) Glucose, (ii) fatty acids and glycerol, (iii) amino acids
12. Which one of the following statements is TRUE for Hydra, Amoeba and Spirogyra?
 (a) They are unicellular. (b) They are multicellular.
 (c) They reproduce asexually. (d) They reproduce sexually.
13. In human beings, fertilization of ovum takes place in :
 (a) Fallopian tubes (b) Ovary (c) uterus (d) Vagina
14. If a round, green seeded pea plant ($RRyy$) is crossed with wrinkled, yellow seeded pea plant ($rrYY$) the seeds to be produced in F_2 generation will be:
 (a) Wrinkled and Yellow (b) Round and Yellow
 (c) Round and Green (d) Wrinkled and Green
15. The egg of an animal contains 10 chromosomes , of which one is X-chromosome. How many autosomes would be there in the karyotype of this animal ?
 (a) 9 (b) 18 (c) 8 (d) 20

16. An electric fuse works on the :
 (a) Chemical effect of current (b) lighting effect of current
 (c) heating effect of current (d) magnetic effect of current
17. Magnetic field lines determine
 (a) Only the direction of magnetic field. (b) Both the direction and the relative strength of magnetic field.
 (c) Only the relative strength of the magnetic field. (d) The shape of magnetic field.
18. An electron beam is moving vertically upwards if it passes through a magnetic field which is directed from south to north in a horizontal plane then in which direction will the beam be deflected?
 (a) Towards south (b) Towards north
 (c) Towards west (d) towards east
19. Assertion : The principle of segregation given by Mendel is the principle of purity of gametes.
 Reason : Gametes are pure for a character and do not mix up.
 (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
 (b) Assertion and reason both are correct statements and reason is not correct explanation for assertion.
 (c) Assertion is correct statement but reason is wrong statement.
 (d) Assertion is wrong statement but reason is correct statement.
20. Assertion : When current is represented by a straight line, the magnetic field will be circular.
 Reason : According to Fleming's left hand rule, direction of force is parallel to the magnetic field.
 (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
 (b) Assertion and reason both are correct statements and reason is not correct explanation for assertion.
 (c) Assertion is correct statement but reason is wrong statement .
 (d) Assertion is wrong statement but reason is correct statement .

Section -B

This section consists of 6 questions of 2 marks each.

21. Iqbal treated a lustrous, divalent element M with sodium hydroxide. He observed the formation of bubbles in react mixture. He made the same observations when this element was treated with hydrochloric acid. Suggest how can he identify the produced gas. Write chemical equation for both the reactions.
22. Ravi was diagnosed with kidney failure. He was advised to undergo dialysis for twice in a week. After undergoing dialysis for a month he was unable to continue the treatment as it is very painful. What alternative treatment solution can you suggest for Ravi other than dialysis.
23. In the given diagram that shows a vertical section through the human heart, which structure separates out the oxygenated blood from deoxygenated blood.
24. (i) A person is suffering from both myopia and hypermetropia.
 (a) What kind of lenses can correct this defect?
 (b) How was these lenses prepared?
 (ii) A person needs a lens of power +3D for correcting his near vision and -3D for connecting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.

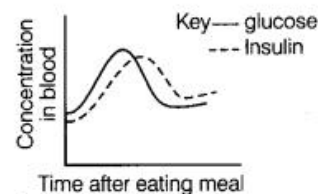


25. Newspaper reports about the alarming increase in pesticides level in packed food items have appeared . As a result some of the states have banned these food items.

- (i) What are the sources of pesticides in the food items?
- (ii) Name the biological phenomenon associated with accumulation of pesticides in the food chain.

26. Following graph show the changes expected after a meal containing starch.

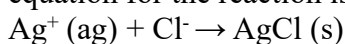
What inference can you draw from the graph shown?



(Section - C)

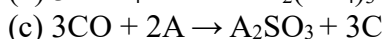
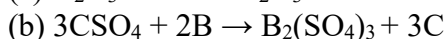
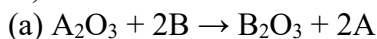
This section consists of 7 questions of 3 marks each.

27. When solutions of silver nitrate and sodium chloride are mixed, white precipitate forms. The ionic equation for the reaction is



- (i) (a) What is the name of the white precipitate?
- (c) Is it a soluble or insoluble compound ?
- (ii) Is the precipitation of silver chloride a redox reaction?

28. A, B and C are 3 elements which undergo chemical reactions according to following equations:

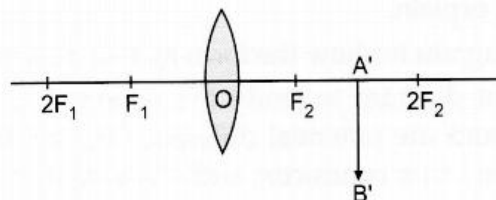


Answer of the following:

- (i) Which element is most reactive?
- (ii) Which element is least reactive?

29. Why the leaf is boiled in alcohol for a few minutes using a water bath in an experiment to show that sunlight is necessary for photosynthesis?

30. Observe the following incomplete ray diagram of an object where the image A'B' is formed after refraction from a convex lens.



On the basis for above information fill in the blanks.

- (i) The position of object AB would have been...
- (ii) Size of the object would have been ... than the size of image.

31. (i) What are magnetic field lines ? How is the direction of a magnetic field at a point determined ? Mention two important properties of magnetic field lines.

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

32. (i) What is mean by biological magnification ?

(ii) Will the levels of this magnification be different at different levels of the ecosystem ?

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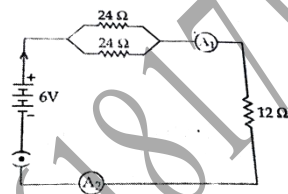
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33. (a) Define focal length of a divergent lens.
 (b) A divergent lens of focal length 30 cm forms the image of an object of size 6 cm on the same side as the object at a distance of 15 cm from its optical centre. Use lens formula to determine the distance of the object from the lens and the size of the image formed.
 (c) Draw a ray diagram to show the formation of image in the above situation.

Section - D

This section consists of 3 questions of 5 marks each.

34. (a) How will you infer with the help of an experiment that the same current flows through every part of the circuit containing three resistors R_1 , R_2 and R_3 in series connected to a battery of V volts ?
 (b) Study the following circuit and find out:
 (i) Current in $12\ \Omega$ resistor.
 (ii) Difference in the readings of A_1 and A_2 , if any.



35. Distinguish between pollination and fertilization. Mention the site and product of fertilization in a flower. Draw a neat, labelled diagram of a pistil showing pollen tube growth and its entry into the ovule.
36. Consider the molecular formula of the carbon compounds (a) and (b) given below:
 (a) C_3H_8O
 (b) $C_3H_6O_2$
 (i) Identify the functional groups in (a) and (b) and write their structures.
 (ii) Are (a) and (b) isomers? Give reason.
 (iii) What happens when alkaline $KMnO_4$ is added, drop by drop, into a test tube containing warm propanol? Write the chemical equation for the reaction and state the role of alkaline $KMnO_4$ in this reaction.

Section - E

This section consists of 3 Case - Study Based Questions of 4 marks each.

37. Read the following text carefully and answer the questions that follow:

A highly polished surface such as a mirror reflects most of the light falling on it. In our daily life we use two types of mirror plane and spherical. The reflecting surface of a spherical mirrors may be curved inwards or outwards. In concave mirrors, reflection takes place from the inner surface, while in convex mirrors reflection takes place from the outer surface.

- (a) Define the principal axis of a concave mirror.
 (b) A ray of light is incident on a concave mirror, parallel to its principal axis. If this ray after reflection from the mirror passes through the principal axis from a point at a distance of 10 cm from the pole of the mirror, find the radius of curvature of the mirror.
 (c) An object is placed at a distance of 10cm from the pole of a convex mirror of focal length 15 cm. Find the position of the image.

OR

A mirror forms a virtual, erect and diminished image of an object. Identify the type of this mirror. Draw a ray diagram to show the image formation in this case.

38. Read the following text carefully and answer the questions that follow:

In fruitflies, the gene for wing shape has two alleles, and unusual allele for curled wings (c) and the normal allele for straight wings (C). The given phenotypes are observed for each genotype.

Genotype	Phenotype
CC	Normal, straight wings
Cc	Wings curled up at the ends, has difficulty flying
cc	Unable to hatch from egg

- Which of the following crosses would be able to produce offspring that would fly normally from 50% of the egg?
- Which of the following crosses would be able to produce offspring that would fly normally from 50% of the egg?
- Normal straight-winged flies are self-crossed and they produce 120 eggs. What is the proportion of curly-winged flies expected among the live offspring?

OR

Two curly-winged flies are crossed, and they produce 150 eggs. What is the proportion of straight-winged flies expected among the live offspring?

39. Read the following text carefully and answer the questions that follow:

Metals are required for a variety of purposes. For this we need their extraction from their ores. Ores mined from the earth are usually contaminated with many impurities which must be removed prior to the extraction of metals. The extraction of pure metal involves the following steps:

- Concentration of ore
- Extraction of the metal from the concentrated ore
- Refining of the metal

Questions:

- Name an ore of Mercury and state the form in which Mercury is present in it.
- What happens to zinc carbonate when it is heated strongly in a limited supply of air?
- The reaction of a metal A with Fe_2O_3 is highly exothermic and is used to join railway tracks.
 - Identify the metal A and name the reaction taking place.
 - Write the chemical equation for the reaction of metal A with Fe_2O_3 .

OR

We cannot use carbon to obtain sodium from sodium oxide. Why? State the reactions taking place at cathode and anode during electrolytic reduction of sodium chloride.

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