



SAMPLE PAPER 5 2024-25

Class 10 - Science

Time Allowed: 3 hours

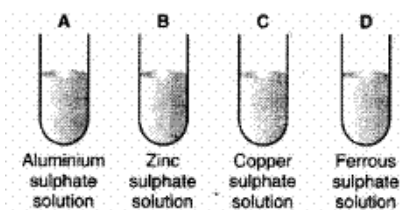
Maximum Marks: 80

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. Answers 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. Zinc granules are placed in each of the four solutions A, B, C and D as shown below decolourisation would be observed in [1]



- a) [B] and [D]
 - b) [A] and [C]
 - c) [C] and [D]
 - d) [A] and [B]
2. The following reaction is an example of a [1]
$$4\text{NH}_3(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 4\text{NO}(\text{g}) + 6\text{H}_2\text{O}(\text{g})$$
 - i. displacement reaction
 - ii. combination reaction
 - iii. redox reaction
 - iv. neutralisation reaction
 - a) (ii) and (iii)
 - b) (i) and (iv)
 - c) (i) and (iii)
 - d) (iii) and (iv)

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 |

9. Which of the following is not an involuntary action? [1]

- | | |
|---------------|---------------|
| a) Heart beat | b) Salivation |
| c) Chewing | d) Vomiting |

10. Which of the following is a characteristic of wind pollinated flowers? [1]

- | | |
|--|---|
| a) Flowers are small with nectar and fragrance. | b) Pollen grains are light, small and dusty whereas the stigma is hairy and feathery. |
| c) Pollen grains are heavy and dry whereas the stigma is short and sticky. | d) Flowers are brightly coloured. |

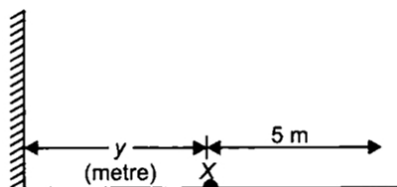
11. How are the two strands in a DNA molecule held together? [1]

- | | |
|------------------|-------------------|
| a) Covalent bond | b) Ionic bond |
| c) Hydrogen bond | d) Phosphate band |

12. In which kind of respiration more energy is released? [1]

- | | |
|------------------------|--------------------------|
| a) All of these | b) Photorespiration |
| c) Aerobic respiration | d) Anaerobic respiration |

13. A man is standing at a position X in front of a plane mirror, a distance of y metre from the mirror as shown in figure. When the man moves 5 m away from the mirror, the new distance between the man and his image becomes 20 metre. What is the value of y ? [1]



- | | |
|---------|---------|
| a) 5 m | b) 40 m |
| c) 10 m | d) 20 m |

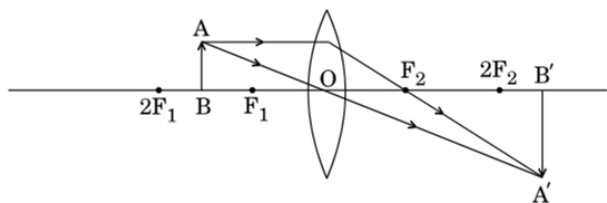
14. Which of the following phenomena is based on atmospheric refraction? [1]

- A. Sun appears to rise 2 minutes before and 2 minutes later
- B. Stars have seen higher than they actually are
- C. Rainbow
- D. The blue colour of clear sky

- | | |
|------------|------------|
| a) A and C | b) A and B |
| c) A and D | d) B and C |

15. Which of the following is biodegradable? [1]

- | | |
|--------------|----------|
| a) Polythene | b) Paper |
|--------------|----------|



- a. Is the type of lens used converging or diverging?
 - b. List three characteristics of the image formed.
 - c. In which position of the object will the magnification be -1?
25. What precaution should be taken to avoid the overloading of domestic electric circuits? [2]

OR

A given length of a wire is doubled on itself. By what factor does the resistance of the wire change?

26. Using the following information, form a pathway which shows the flow of energy at each trophic level. And also include information that is not mentioned below to complete it. [2]
- light energy, organic products, first trophic level, herbivores, second trophic level, energy.

Section C

27. A lady bought a new iron container and kept blue vitriol solution into it. On the next day, she found that the blue colour of the solution fades. She went to the shopkeeper and complained. [3]
- But the shopkeeper argued that the container is of good quality and he refused to return her money. An aware person Ankit came there and asked the matter. He told the lady that the container is of good quality and you have kept the wrong substance in it, so fault is all yours.

On the basis of given passage, answer the following questions.

- i. What qualities are exhibited by Ankit?
 - ii. Why the container becomes porous when blue vitriol solution is kept into it?
28. (i) Name a metal for each case: [3]
- (a) It does not react with cold as well as hot water but reacts with steam.
 - (b) It does not react with any physical state of water.
- (ii) When calcium metal is added to water the gas evolved does not catch fire but the same gas evolved on adding sodium metal to water catches fire. Why is it so?

OR

Solid sodium chloride does not conduct electricity whereas molten sodium chloride conducts electricity. Explain.

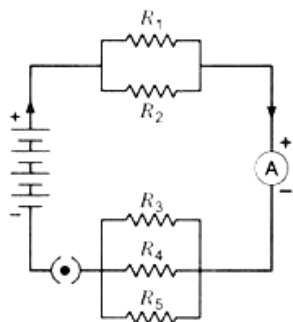
29. What is the logic behind the heavy breathing as we climb up a mountain? [3]
30. i. Who provided the evidence of DNA as genetic material? [3]
- ii. Why DNA is called polynucleotide?
 - iii. List three important features of double helical model of DNA.
31. A student wants to project the image of a candle flame on a screen 80 cm in front of a mirror by keeping the candle flame at a distance of 20 cm from its pole. [3]
- i. Which type of mirror should the student use?
 - ii. Find the magnification of the image produced.
 - iii. Find the distance between the object and its image.
32. Three students X, Y and Z while performing the experiment to study the dependence of current on the potential difference across a resistor, connect the ammeter (A), the battery (B), the key (k) and the resistor (R) in series, in the following three different orders. [3]

- i. X → B, K, R, A, B
- ii. Y → B, A, K, R, B
- iii. Z → B, R, K, A, B

Who has connected them in the correct order?

33. If in the figure $R_1 = 10\Omega$, $R_2 = 40\Omega$, $R_3 = 30\Omega$, $R_4 = 20\Omega$, $R_5 = 60\Omega$, and a 12 V battery is connected to the arrangement. Calculate [3]

- i. the total resistance in the circuit, and
- ii. the total current flowing in the circuit.

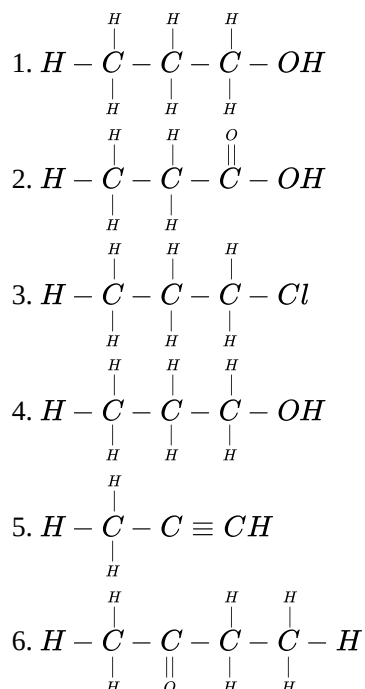


Section D

34. i. What is a homologous series of carbon compounds? Write general formula for alkynes. Name and draw the electron dot structure of first homologue of this series. [5]
- ii. State the meaning of the functional group in an organic compound. Write the formula of the functional group present in alcohols and carboxylic acids.

OR

Name the following compounds.



35. What is contraception? List its four different methods. State four reasons for adopting contraceptive methods. [5]

OR

- a. Name the hormone secreted by (i) Pituitary, and (ii) Thyroid stating one main function of each. Name the disorder a person is likely to suffer from due to the deficiency of the above mentioned hormones.
- b. How is the timing and amount of hormone released regulated? Explain with an example.

36. a. List four characteristics of the image formed by a concave lens of focal length 20 cm when the object is placed at a distance of 40 cm from its optical centre. [5]
- b. The size of image of an object by a convex lens of focal length 20 cm is observed to be reduced to $\frac{1}{3}$ rd of its size. Find the distance of the object from the optical centre of the lens.

OR

A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position, and size of the image. Also, find its magnification.

Section E

37. **Read the following text carefully and answer the questions that follow:** [4]

The melting points and boiling points of some ionic compounds are given below:

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.

- Show the electron transfer in the formation of magnesium chloride. (1)
- What happens at the cathode when electricity is passed through an aqueous solution of sodium chloride? (1)
- While forming an ionic compound say sodium chloride how does sodium atom attain its stable configuration? (2)

OR

Why do ionic compounds in the solid state not conduct electricity? (2)

38. **Read the following text carefully and answer the questions that follow:** [4]

A student crossed pea plants having round and yellow seeds with pea plants having wrinkled and green seeds. He found that only one type of seeds were produced in the F₁ generation. When these F₁ generation pea plants were self-pollinated with each other, then in addition to the seed type of F₁ generation, some new types of seed combinations were also obtained in the F₂ generation.

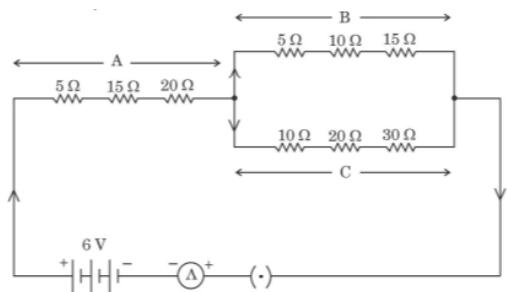
- Which traits in the above mentioned cross are dominant traits? (1)
- What are the new possible combinations of seeds likely to be observed in F₂ generation? (1)
- Give reason why the traits which were not visible in the seeds of F₁ generation reappeared in the seeds of F₂ generation. Write the ratio of different types of seeds obtained in F₂ generation in this case. (2)

OR

What is meant by the terms (I) dominant, and (II) recessive traits? Explain. (2)

39. **Read the following text carefully and answer the questions that follow:** [4]

Study the following electric circuit in which the resistors are arranged in three arms A, B and C:



- i. Find the equivalent resistance of arm B. (1)
- ii. Calculate the equivalent resistance of the parallel combination of the arms B and C. (1)
- iii. Determine the current that flows through the ammeter. (2)

OR

Determine the current that flows in the ammeter when the arm B is withdrawn from the circuit. (2)

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