

Class: X

Date: 11/12/2024

Duration: 3 Hrs.

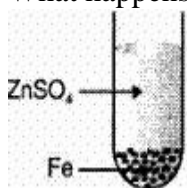
Max. Marks: 80

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 What happens in the test tube shown here? 1



- a) H<sub>2</sub> O will produce b) SO<sub>2</sub> will produce  
 c) No reaction d) FeO will produce
- 2  $2\text{FeSO}_4 \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$  1  
 The above reaction is  
 a) Double displacement reaction b) Combination reaction  
 c) Displacement reaction d) Decomposition reaction
- 3 Sodium bicarbonate solution is added to dilute ethanoic acid. It is observed that 1  
 a) the mixture becomes light yellow b) the mixture becomes warm  
 c) a solid settles at the bottom d) a gas evolves
- 4 Pentane has the molecular formula C<sub>5</sub> H<sub>12</sub>. It has 1  
 a) 5 covalent bonds b) 17 covalent bonds  
 c) 12 covalent bonds d) 16 covalent bonds
- 5 Aluminum is used for making cooking utensils. Which of the following properties of 1



Aluminum are responsible for the same?

1. Good thermal conductivity
  2. Good electrical conductivity
  3. Ductility
  4. High melting point
- a) (i) and (ii)
  - b) (i) and (iii)
  - c) (ii) and (iii)
  - d) (i) and (iv)
- 6 Which of the following has an electrovalent bond(s)? 1
1. CaF
  2. NaCl
  3. MgO
  4. CO<sub>2</sub>
- a) A and C
  - b) A, B and C
  - c) All of these
  - d) C and D
- 7 Which of the following is not an allotropic form of carbon? 1
- a) Diamond
  - b) Fluorine
  - c) Graphite
  - d) Fullerene
- 8 The plant material used to demonstrate that carbon dioxide is released during respiration is: 1
- a) A potted plant with green leaves
  - b) Detached green leaves
  - c) A plant with variegated leaves
  - d) Germinating seeds
- 9 A monohybrid cross is conducted between one variety of pea plants having pods that are full (FF) and another having pods that are constricted (ff). What is the percentage of heterozygous offspring in F1 generation? 1
- a) 100%
  - b) 75%
  - c) 50%
  - d) 25%
- 10 The thread-like structure that develop on a moist slice of bread in Rhizopus are: 1
- a) Sporangia
  - b) Filaments
  - c) Rhizoids
  - d) Hyphae
- 11 How many pairs of contrasting characters of pea were selected by Mendel for cross - fertilization? 1
- a) Five
  - b) Six
  - c) Twelve
  - d) Seven
- 12 A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains 1
- a) complex proteins
  - b) simple proteins
  - c) fats
  - d) starch
- 13 Which of the following correctly describes the magnetic field near a long straight wire? 1
- a) The field consists of straight lines parallel to the wire
  - b) The field consists of concentric circles centred on the wire
  - c) The field consists of straight lines perpendicular to the wire
  - d) The field consists of radial lines originating from the wire
- 14 The unit of electrical resistance is: 1
- a) Ampere
  - b) Coulomb
  - c) Ohm
  - d) Volt
- 15 Accumulation of non - biodegradable pesticides in the food chains in increasing amount at each higher trophic level is known as : 1
- a) Biological magnification
  - b) Accumulation
  - c) Eutrophication
  - d) Pollution
- 16 An example of a man-made ecosystem is: 1
- a) Grassland
  - b) River
  - c) Desert
  - d) Garden
- 17 Assertion (A): A chemical reaction becomes faster at higher temperatures. 1  
Reason (R): At higher temperatures, molecular motion becomes more rapid.

- 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.
- 18 Assertion (A): Yeast multiplies in sugar. 1  
 Reason (R): Sugar provides energy for sustaining all life activities.  
 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.
- 19 Assertion (A): A compass needle is placed near a current - carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire. 1  
 Reason (R): Strength of a magnetic field decreases as one moves away from a current - carrying conductor.  
 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.
- 20 Assertion (A): Ozone layer protects the surface of the Earth from harmful UV radiations. 1  
 Reason (R): Chlorofluorocarbons (CFCs) are responsible for depletion of ozone layer.  
 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.

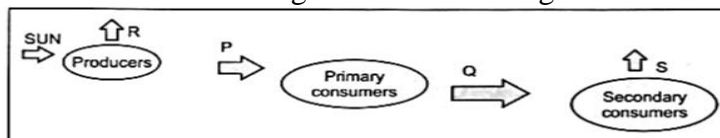
### Section B

- 21 Carbon forms strong bonds with most other elements making the compounds exceptionally stable. Give reason to justify this statement. 2
- 22 a) Mention the information source for making proteins in the cell. 2  
 b) What is the basic event in reproduction?
- 23 How do the guard cells regulate opening and closing of stomatal pores? 2

**OR**

Write a short note on root pressure.

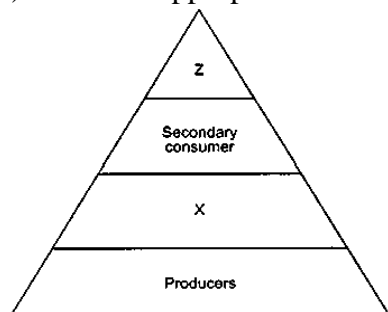
- 24 State and explain the factors on which lateral shift depends. 2
- 25 a) Which of the labelled arrows in the below diagram represents the smallest amount of energy transferred between organisms and the largest amount of energy lost to ecosystem? 2



b) What is the role of decomposers in the ecosystem?

**OR**

a) Write the appropriate names of the trophic levels Z and X in the figure given below:



b) Food chains generally consist of only three or four steps. Why?

- 26 What is the power of accommodation? 2

Section C

- 27 You are given a hammer, a battery, a bulb, wires and switch. 3  
 (a) How would you use them to distinguish between samples of metals and non metals?  
 (b) Assess the usefulness of these tests to distinguish between metals and non - metals.
- 28 State three reasons for the following facts: 3  
 a) Sulphur is a non - metal.  
 b) Magnesium is a metal.  
 One of the reasons must be supported with a chemical equation.

**OR**

In a chemistry laboratory, students were instructed to set up three experiments, details of which are given below:

Experiment No.	Set up details
1.	2 iron nails in a cork capped test tube + Tap water immersing the nails +
2.	2 iron nails in a cork capped test tube + Boiled water immersing the nails + Oil on top of water layer.
3.	2 iron nails In a cork capped test tube + Cotton wool on top of the iron nails + Granules of calcium chloride on cotton wool.

Indicate the changes observed in the nails kept in all the three setups, with reasons.

- 29 a) 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? 3  
 b) Which muscle regulates the exit of food from the stomach into the small intestine?  
 c) Herbivores eating grass need a longer small intestine. Give reason.
- 30 Study the following cross that shows the self - pollination in  $F_1$ , fill in the blank the genotype and phenotype in the  $F_1$  generation. What type of cross it is? Find the ratio of  $F_2$  generation with the help of cross. 3

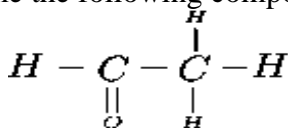
Parents	RRYY	x	rryy
	Round, yellow		wrinkled, green
$F_1$ —	Rr Yy	x	?
	Round, yellow		

- 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  
 a) Which type of mirror should the student use?  
 b) Find the magnification of the image produced.  
 c) Find the distance between the object and its image.
- 32 Compare the power used in  $2\Omega$  resistor in each of the following circuits 3  
 a) 6V battery in series with  $1\Omega$  and  $2\Omega$  resistors and  
 b) 4V battery in parallel with  $12\Omega$  and  $2\Omega$  resistors.
- 33 An electric motor rated 1100 W is connected to 220 V mains. Find: 3  
 a) The current drawn from the mains,  
 b) Electric energy consumed if the motor is used for 5 hours daily for 6 days.  
 c) Total cost of energy consumed if the rate of one unit is ₹ 5.

Section D

- 34 a) Compare soaps and detergents on the basis of their composition and cleansing action in hard water. 5  
 b) What happens when ethanol is treated with sodium metal? State the behaviour of ethanol in this reaction.  
 c) Draw the structure of cyclohexane.

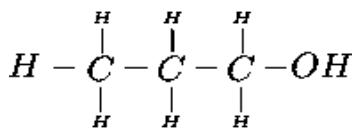
d) Name the following compound.



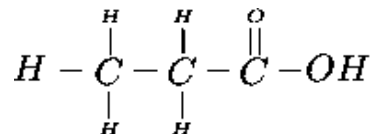
**OR**

Name the following compounds.

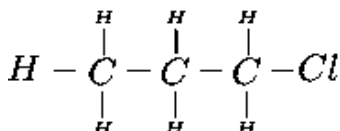
1.



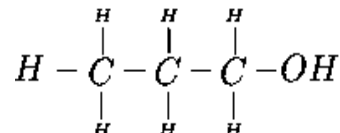
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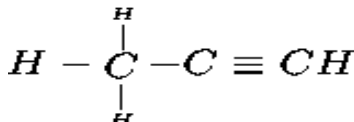
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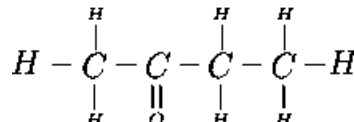
4.



5.



6.



35



5

- a) Identify the organisms A and B and the mode of asexual reproduction exhibited by them.  
b) How will an organism be benefited if it reproduces through spores?  
c) Mention the two asexual methods by which Hydra can reproduce. Explain briefly any one such method.

**OR**

Draw a labeled diagram of neuron and explain its function.

36 What is lens formula? Give its sign conventions and assumptions.

5

**OR**

An object 2 cm high is placed at a distance of 16 cm from a concave mirror which produces a real image 3 cm high.

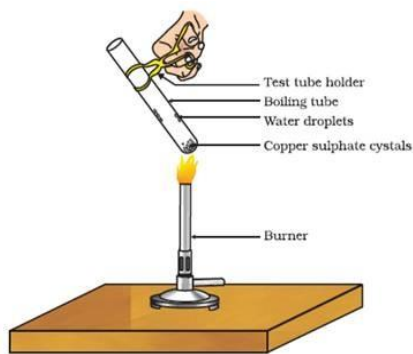
- (i) Find the position of the image.  
(ii) What is the focal length of mirror?

Section E

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

4

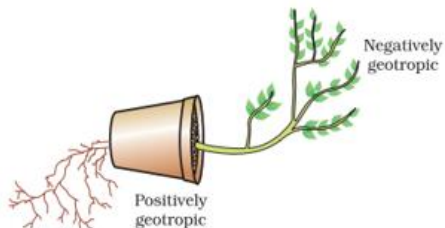
Copper sulphate crystal contains water of crystallisation when the crystal is heated the water is removed and salt turns white. The crystal can be moistened again with water. The water of crystallisation is the fixed number of water molecules present in 1 formula unit of copper sulphate. On heating gypsum at 373K, it loses water molecules and became calcium sulphate hemihydrate.



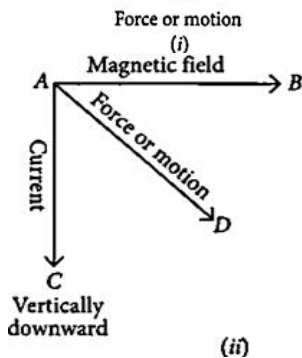
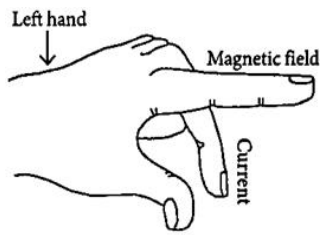
- If the crystal is moistened with water, then which colour of the crystal reappears?
- What is the commercial name of calcium sulphate hemihydrate?
- How many water molecules are present in one formula unit of copper sulphate?

**OR**

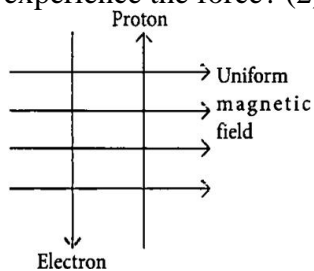
- What is obtained when gypsum is heated at 373K?
- 38 Read the following text carefully and answer the questions that follow: 4
- Environmental triggers such as light, or gravity will change the directions that plant parts grow in. These directional, or tropic, movements can be either towards the stimulus or away from it. So, in two different kinds of phototropic movement, shoots respond by bending towards light while roots respond by bending away from it. How does this help the plant? Plants show tropism in response to other stimuli as well. The roots of a plant always grow downwards while the shoots usually grow upwards and away from the earth. This upward and downward growth of shoots and roots, respectively, in response to the pull of earth or gravity, is, obviously, geotropism. If 'hydro' means water and 'chemo' refers to chemicals, what would 'hydrotropism' and 'chemotropism' mean? Can we think of examples of these kinds of directional growth movements? One example of chemotropism is the growth of pollen tubes towards ovules, about which we will learn more when we examine the reproductive processes of living organisms.



- Where does negative phototropism occur in plants? (1)
  - Phototropism in shoots is attributed due to which plant hormone? (1)
  - Tendrils exhibit/ twining of tendrils show which type of tropic movement? (2)
- OR**
- If the stem grows towards sunlight and the root grows just opposite to it, then what type of movement of the stem is it? (2)
- 39 Read the following text carefully and answer the questions that follow: 4
- Andre Marie Ampere suggested that a magnet must exert an equal and opposite force on a current - carrying conductor, which was experimentally found to be true. But we know that current is due to charges in motion. Thus, it is clear that a charge moving in a magnetic field experience a force, except when it is moving in a direction parallel to it. If the direction of motion is perpendicular to the direction of magnetic field, the magnitude of force experienced depends on the charge, velocity ( $v$ ), strength of magnetic field ( $B$ ), and sine of the angle between  $v$  and  $B$ . Direction of magnetic force is given by Fleming's left - hand rule.



- a) If an electron is travelling horizontally towards east. A magnetic field in vertically downward direction exerts a force on the electron along which direction? (1)
- b) A charged particle is moving with velocity  $v$  in a magnetic field of induction  $B$ . The force on the particle will be maximum when (1)
- c) A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field, an electron and a proton move as shown. Where do the electron and the proton experience the force? (2)



**OR**

- c) An electron beam enters a magnetic field at right angles to it as shown in the figure. What would be the direction of force acting on the electron beam? (2)

