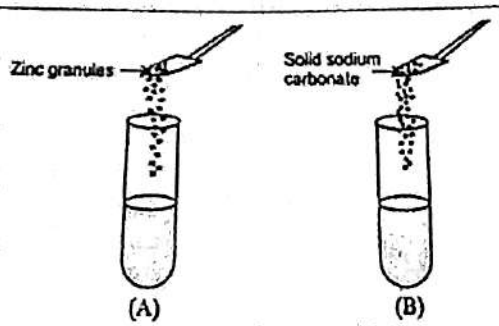
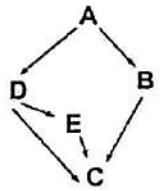
ST MARY'S SCHOOL, SAFDARJUNG ENCLAVE
CLASS X: SCIENCE (086)
FIRST TERM EXAMINATION 2024-25

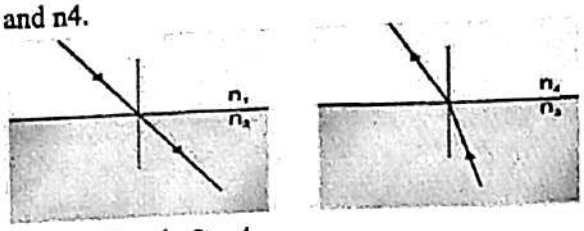
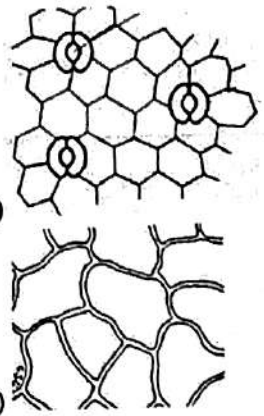
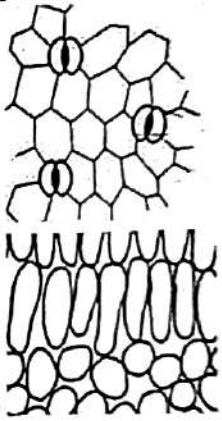
Time: 3 hours **M. M.: 80**

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 in the range of 50 to 80 words
vi. 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.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

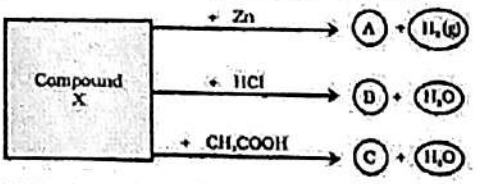
SECTION - A Select and write one most appropriate option out of the four options given for each of the questions 1 – 20		
Q1.	Which one of the following salts does not contain water of crystallization? (a) Plaster of paris (b) Baking soda (c) Washing soda (d) Gypsum	(1)
Q2.	Which of the following oxides of iron would be obtained on the prolonged reaction of iron with steam? (a) FeO (b) Fe_2O_3 (c) Fe_3O_4 (d) Fe_2O_3 and Fe_3O_4	(1)
Q3.	Which of the following are exothermic processes? (i) Decomposition of vegetable matter into compost (ii) Formation of water from H_2 and O_2 gasses (iii) Evaporation of water (iv) Dilution of an acid (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)	(1)
Q4.	A small amount of copper oxide is taken in a test tube and dilute hydrochloric acid is added to it with stirring. Which colour will be obtained in the test tube? (a) Blue-green (b) White (c) Black (d) Pink	(1)
Q5.	Name the acid present in the following: (i) Vinegar (ii) Tomato	(1)
Q6.	Write the chemical formula of hydrated copper sulphate and anhydrous copper sulphate	(1)
Q7.	A student took two test tubes containing 2 ml of dilute hydrochloric acid and added zinc granules to test tube (A) and solid sodium carbonate to test tube (B) as shown below	(1)

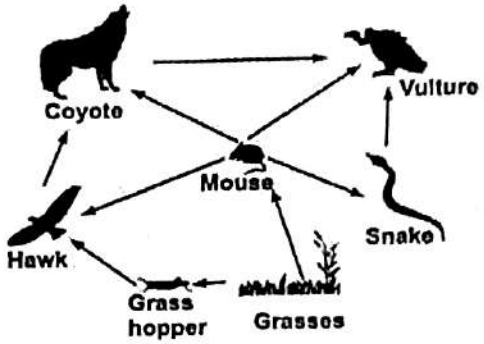
	 The correct observation would be: (a) Rapid reaction in both test tubes (b) Slow reaction in (A) and rapid reaction in (B) (c) Rapid reaction in (A) but a slow reaction in (B) (d) No reaction in any of the test tubes	
Q8.	A food web including five species is shown below with 'A' as the autotrophs.  **Which of the following is most likely to cause the greatest decline in the species B population?** (a) A decrease is species 'C' (b) A decrease in species 'A' (c) A decrease in species 'D' (d) An increase in species 'E'	**(1)**
Q9.	*Rafflesia arnoldii* is an interesting species of plant for several reasons. It produces huge flowers that smell like rotting flesh, but has no leaves, stem or roots. Instead, it grows thread-like tissues that embed themselves in the cells of nearby grape vines, from which it sucks nutrients and water. **What form of nutrition does *Rafflesia* utilise?** (a) Autotrophic (b) Holozoic (c) Parasitic (d) Saprophytic	**(1)**
Q10.	Which among the following are **not** the functions of testes at puberty? (i) formation of germ cells (ii) secretion of testosterone (iii) development of placenta (iv) secretion of estrogen (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)	**(1)**
Q11.	The correct sequence of reproductive stages seen in flowering plants is (a) gametes, zygote, embryo, seedling (b) zygote, gametes, embryo, seedling (c) seedling, embryo, zygote, gametes (d) gametes, embryo, zygote, seedling	**(1)**
Q12.	**Which of the following statements about heterotrophic nutrition is true?** (a) It involves intake of simple inorganic compounds like carbon dioxide (b) Food can be broken down into nutrients either inside or outside the body (c) All organisms other than plants live in close association with the host. (d) All heterotrophs feed by killing and eating the prey.	**(1)**

13.	A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. The following is the order of combinations for the magic mirror from the top. (a) Plane, convex and concave (b) Convex, concave and plane (c) Concave, plane and convex (d) Convex, plane and concave	(1)
Q14.	The amount of light entering the human eye is controlled by (a) Ciliary muscles (b) Pupil (c) Cornea (d) Iris	(1)
Q15.	Studying the two figures given above, find out the relation between refractive indices n1, n2, n3 and n4.  (a) n1>n2 and n3>n4 (b) n1=n2 and n3<n4 (c) n1=n2 and n3>n4 (d) n1<n2 and n3<n4	(1)
Q16.	Which of the following correctly depicts the stomata when the plant is under water stress. (a)  (b)  (c) (d)	(1)

Q. no 17 to 20 are Assertion - Reasoning based questions. These 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

Q17.	**Assertion (A)** - Brown fumes are produced when lead nitrate is heated. **Reason (R)** - Nitrogen dioxide gas is produced as a by-product due to the decomposition of lead nitrate.	(1)
Q18.	**Assertion (A):** Desert plants prepare to take up carbon dioxide at night and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day. **Reason (R):** Taking carbon dioxide at night allows them to conserve water.	(1)

Q19.	**Assertion (A)** - The phenomenon of scattering of light by the colloidal particles gives rise to Tyndall effect. **Reason (R)** - The colour of the scattered light depends on the size of the scattering particles.	(1)
Q20.	**Assertion (A):** Variations always provide a survival advantage to an organism. **Reason (R):** Variations can be caused due to incorrect DNA copying.	(1)
	SECTION – B Q. no. 21 to 26 are very short answer questions.	
Q21.	Identify the compound X on the basis of the reactions given below. Also, write the name and chemical formulae of A, B and C. 	(2)
Q22.	Ravi cultivated mustard, a plant with bisexual flowers, on his farm. His plants were diseased due to a gene defect and therefore had reduced yield. Ravi removed the stamens from the diseased plants and also planted fresh disease2 free mustard plants where he removed the pistils. How will Ravi's strategy help in improving the yield of mustard?	(2)
Q23.	Define Photosynthesis. Give its balanced chemical equation.	(2)
Q24.	When an object is placed at a distance of 60cm from a convex mirror, the magnification produced is 1/2. Where should the object be placed to get a magnification of ⅓ keeping the final image position same?	(2)
Q25.	Two thin lenses of power +2.5D and -1.5 D are placed in contact. Find the power & focal length of the lens combination? **OR** Two thin lenses of focal lengths +10 cm and – 15 cm are kept in contact. What is the focal length and power of the combination?	(2)
Q26.	State the role of the liver in the process of digestion.	(2)
	SECTION - C Q.no. 27 to 33 are short answer questions.	
Q27.	(a)A milkman adds a very small amount of baking soda to fresh milk. (i) Why does he shift the pH of the fresh milk from 6 to slightly alkaline? (ii) Why does this milk take a long time to set as curd? (b) How is the concentration of hydronium ions affected when a solution of an acid is diluted?	(3)
Q28.	(a) Show the formation of sodium oxide Na_2O and MgO by the transfer of electrons. (b) Why do ionic compounds have high melting points? **OR** A compound 'A' is used in white washing. When dissolved in water, it evolves a large amount of heat and forms compound 'B'. (a) Identify the compounds 'A' and 'B'.	(3)

	(b) Write a balanced chemical equation for the reaction of the compound 'A' with water. (c) Identify the type of reaction taking place.	
Q29.	Observe the food web given below and answer the questions that follow:  a) Identify the primary consumer from the food web. b) Make a food chain from the above food web with least trophic levels. c) If the amount of energy available to the third trophic level in a food chain is 10KJ, then how much energy was available at the second trophic level?	(3)
Q30.	With the help of labelled diagram, explain nutrition in Amoeba **OR** With the help of a labelled diagram, explain the internal structure of leaves.	(3)
Q31.	A 3 cm tall object is placed perpendicular to the principal axis of a converging lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position, size and magnification of the image.	(3)
Q32.	(i) Draw a labeled diagram to show the passing of white light through a glass prism. (ii)Why is the color of the danger signal red? (iii)Does splitting of light take place in glass slabs also? Give reason to support your answer.	(3)
Q33.	With a concave mirror, an object is placed at a distance x1 from the principal focus. The real image is formed at a distance x2 from the principal focus. ~~Both the object and image are between principal focus and pole.~~ Prove that focal length of the mirror $f=(x1x2)^{1/2}$	(3)
	SECTION - D Q.no. 34 to 36 are Long answer questions.	
Q34.	**Answer the following questions:** (a) Write the chemical name and formula of the salt used to remove permanent hardness of water. (b) Why is the process to manufacture sodium hydroxide called the chlor-alkali process? (c) Which acid is injected by the sting of honey-bee? (d) Rita decided to bake a cake and added baking soda to the cake batter. Explain the function of the baking soda. (e) Write the chemical equation to prepare bleaching powder. **OR**	(5)

	(a) A cloth strip dipped in clove oil is used for testing a liquid 'X'. The liquid 'X' changes its odour. Which type of an indicator is clove oil? The liquid 'X' turns blue litmus red. Name the gases evolved when the liquid 'X' reacts with the following: (i) Zinc granules (ii) Solid sodium carbonate (b) Write the balanced chemical equations for the following reactions: (i) Reaction of dilute hydrochloric acid with dilute sodium hydroxide. (ii) Reaction of aluminium oxide with dilute hydrochloric acid.	
Q35.	A Non-Government Organisation (NGO) aims to increase awareness against STDs. (a) Mention any TWO potential long-term health-related complications of untreated STDs that the NGO should educate the target age group about. (b) Mention ONE contraceptive method that provides protection against the STD. Justify. (c) State TWO contraceptive methods that are easy to use and effective in the long run. (d) Removal of gonads cannot be considered as a contraceptive option. Justify.	(5)
Q36.	What is atmospheric refraction? Use this phenomenon to explain the following natural events. i)Twinkling of stars. ii) advanced sunrise and delayed sunset. Draw a diagram to illustrate your answers. **OR** Explain myopia and hypermetropia with the help of ray diagrams and show how these defects can be corrected with diagrams?	(5)
SECTION - E Q.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.		
Q37.	All metals do not react with oxygen at the same rate. Almost all metals combine with oxygen to form metal oxides. Metal oxides are basic in nature. But some metal oxides, such as aluminium oxide, zinc oxide, etc., show both acidic as well as basic behaviour. Reaction of metals with water and dilute acids also take place at different rates to liberate hydrogen gas. Based on the above information answer the following questions: (a) What name is given to metal oxides which react with both acids as well as bases to produce salts and water . (b) Why does calcium start floating when reacted with water? (c) Name two metals that react violently with cold water and also write the chemical equation of one of these metals with water. **OR** (c) Explain why hydrogen gas is not evolved when a metal reacts with nitric acid? Name two metals which react with very dilute nitric acid to evolve hydrogen gas.	(4)
Q38.	A biology student after studying the menstrual cycle, was comparing the two subjects (patients). A table was created to compare the condition of the two subjects. Read the information in the table carefully ro answer the questions that follow;	(4)

Subject 1	Shows presence of disc like structure attached to the uterine wall	Thick uterine wall is thick and richly supplied with blood vessels

Subject 2	Shows absence of disc like structure	The uterine wall is thin without any supply of blood vessels

i. What is the disc shaped structure called that is present in subject 1. Give its function.

ii. Which of the following statements is true about the subjects?

(a) Subject 1 is pregnant (b) Subject 2 is pregnant

(c) Subject 1 and 2 both are pregnant (d) Subject 1 and 2 both are not pregnant

iii. For subject 1, the disc shaped structure is rapidly growing in size. After approximately how much time is it expected to get expelled from the uterus?

Q39. 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:(choice is between c & d) **(4)**

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.

(b) List two properties of the image formed in case 2.

(c) What is the nature and size of the image formed by mirror C? Draw ray diagram to justify your answer.

OR

(a) 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.