Time: 3 Hours **Max. Marks: 80**

General Instructions:

1. All questions would be compulsory. However, an internal choice of approximately 33%would be provided. 50% marks are to be allotted to competency-based questions.
2. Section A would have 16 simple/complex MCQs and 04 Assertion-Reasoning type questions carrying 1 mark each.
3. Section B would have 6 Short Answer (SA) type questions carrying 02 marks each.
4. Section C would have 7 Short Answer (SA) type questions carrying 03 marks each.
5. Section D would have 3 Long Answer (LA) type questions carrying 05 marks each.
6. Section E would have 3 source based/case based/passage based/integrated units of assessment (04 marks each) with sub-parts of the values of 1/2/3 marks.

SECTION-A

Question 1 to 16 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

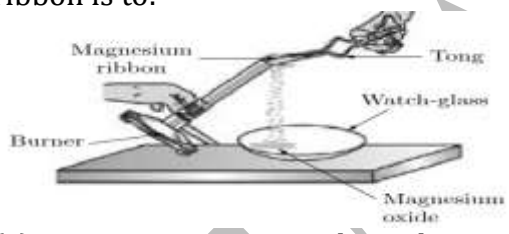
1. Identify 'x', 'y', and 'z' in the following balanced reaction:
x Al (s) + y O_2 (g) → z Al_2O_3 (s)
(a) 4, 3, 2 (b) 2, 1, 1 (c) 4, 2, 2 (d) 2, 3, 2

2. 4 moles of aluminium react with 3 moles of oxygen to form 2 moles of aluminium oxide. Consider the following table :

Substance	pH
Lemon	2.3
Battery acid	x
Sea water	8.5
Apple	3.1

The value of x in above table is:
(a) 0 (b) 1.3 (c) 2.5 (d) 1.9

3. Magnesium ribbon is rubbed with sand paper before making it to burn. The reason of rubbing the ribbon is to:



(a) remove moisture condensed over the surface of ribbon.
(b) generate heat due to exothermic reaction.
(c) remove magnesium oxide formed over the surface of magnesium.
(d) mix silicon from sand paper (silicon dioxide) with magnesium for lowering ignition temperature of the ribbon.

4. A student traces the path of a ray of light through a glass prism for different angles of incidence. He analysis each diagram and draws the following conclusion:
I. On entering prism, the light ray bends towards its base.
II. Light ray suffers refraction at the point of incidence and point of emergence while passing through the prism.
III. Emergent ray bends at certain angle to the direction of the incident ray.
IV. While emerging from the prism, the light ray bends towards the vertex of the prism.
Out of the above inferences, the correct ones are:
(a) I, II and III (b) I, III and IV (c) II, III and IV (d) I and IV

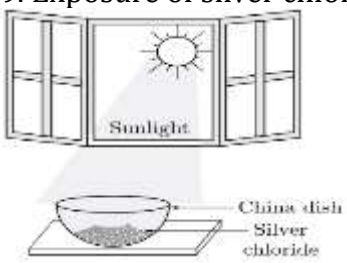
(a) Stomata (b) Guard cell (c) Lenticel (d) Epidermis

6. A feature of reproduction that is common to Amoeba, Spirogyra and yeast is that
(a) They reproduce asexually (b) They are all unicellular
(c) They reproduce only sexually (d) They are all multicellular

7. Ethane (C_2H_6) on complete combustion gave CO_2 and water. It shows that the results are in accordance with the law of conservation of mass. Then, the coefficient of oxygen is equal to
(a) 7/2 (b) 3/2 (c) 5/2 (d) 9/2

8. When white light passes through the achromatic combination of prisms, then what is observed ?
(a) Deviation (b) Dispersion
(c) Both deviation and dispersion (d) Atmospheric refraction

9. Exposure of silver chloride to sunlight for a long duration turns grey due to



Which among the following statement(s) is(are) true?
(i) the formation of silver by decomposition of silver chloride.
(ii) sublimation of silver chloride.
(iii) decomposition of chlorine gas from silver chloride.
(iv) oxidation of silver chloride.
(a) Only 1 (b) 1 and 3 (c) 2 and 3 (d) Only 4

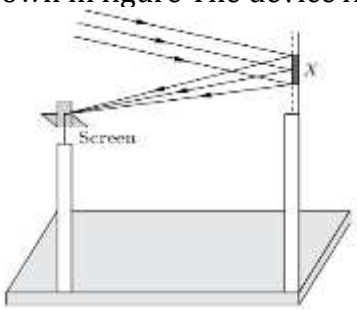
10. Magnesium reacts with hot water and steam both. Human body stores energy in form of:
(a) Glucose (b) Insulin (c) glycogen (d) Fructose

11. No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be-
(a) Plane (b) Concave (c) Convex (d) Either plane or convex

12. What must be preserved in an ecosystem, if the system needs to be maintained?
(a) Producers and carnivores (b) Producers and decomposers
(c) Carnivores and decomposers (d) Herbivores and carnivores

13. Posture and balance of the body is controlled by
(a) cerebrum (b) cerebellum (c) medulla (d) pons

14. A student determines the focal length of a device X , by focusing the image of a far off object on the screen positioned as shown in figure The device X is a



(a) Convex lens (b) Concave lens (c) Convex mirror (d) Concave mirror

15. Which among the following statements is incorrect for magnesium metal?

(a) It burns in oxygen with a dazzling white flame.
(b) It reacts with cold water to form magnesium oxide and evolves hydrogen gas.
(c) It reacts with hot water to form magnesium hydroxide and evolves hydrogen gas.
(d) It reacts with steam to form magnesium hydroxide and evolves hydrogen gas.
16. Mineral acids are stronger acids than carboxylic acids because
(i) mineral acids are completely ionized. (ii) carboxylic acids are completely ionized
(iii) mineral acids are partially ionized (iv) carboxylic acids are partially ionized
(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (ii) (d) (iii) and (iv)
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Question no. 17 to 20 are Assertion-Reasoning based questions.
17. Assertion: Photosynthesis is considered as an endothermic reaction.
Reason: Energy gets released in the process of photosynthesis.
(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
(c) Assertion is True but the Reason is False. (d) Both Assertion and Reason are False.
18. Assertion: Our body maintains blood sugar level.
Reason: Pancreas secretes insulin which helps to regulate blood sugar levels in the body.
(a)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.
19. Assertion: Artificial kidney is a device used to remove nitrogenous waste products from the blood through dialysis.
Reason: Reabsorption does not occur in artificial kidney.
(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) Assertion is true but Reason is false. (d) Assertion is false but Reason is true.
20. Assertion: The product of resistivity and conductivity of a conductor depends on the material of the conductor.
Reason: Because each of resistivity and conductivity depends on the material of the conductor.
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.

SECTION-B

Question no. 21 to 26 are very short answer questions.
21. If you keep the potted plant horizontally for 2-3 days, what type of movements would be shown by the shoot and root after two or three days. Why?
22. What are the rules of inheritance?
23. A. What prevents the metals such as magnesium, aluminium, zinc and lead from oxidation at ordinary temperature?

OR

B. Explain why sodium hydroxide solution cannot be kept in aluminium containers? Write equation for the reaction that may take for the same.
24. What is meant by pollination? Name and differentiate between the two modes of pollination in flowering plants.
25. A. State two positions in which a concave mirror produces a magnified image of a given object. List two differences between the two images.

OR

B. What is the difference between virtual images produced by concave, plane and convex mirror?

26. In the cartoon below, a rabbit is shown eating grass and later a fox is seen hunting the rabbit. In the next frame, after the fox dies, mushrooms and earthworms are feeding on its body.

What role do the rabbit and fox play in the food chain?

SECTION-C

Question no. 27 to 33 are short answer questions.

27. Aman creates a compact device that uses an organic compound (C3H8O) reacting with sodium metal to produce hydrogen gas. This hydrogen powers a fuel cell, providing a clean and immediate energy source. Deduce the possible structure of the compound. Write the balanced chemical equation of the reaction.

28. A. Our government launches campaigns to provide information about AIDS prevention, testing and treatment by putting posters, conducting radio shows and using other agencies of advertisements. To which category of diseases AIDS belongs ? Name and explain. What is its causative organism ? Also give two more examples of such diseases.

OR

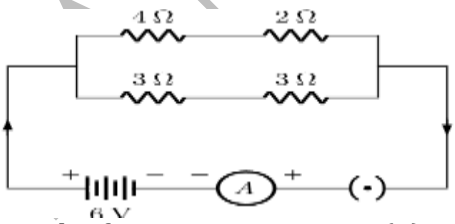
B. Distinguish between pollination and fertilisation. Mention the site and the product of fertilisation in a flower.

29. Explain the following chemical changes, giving one example in each case :
(i) Displacement or substitution, (ii) Dissociation, (iii) Isomerisation reaction.

30. Why does a ray of light passing through the centre of curvature of a concave mirror after reflection, is reflected back along the same path ?

31. (i) A compound lens is made of two lenses in contact having powers . +12.5D and . – 2.5 D. Find the focal length and power of the combination.
(ii) The magnification produced by a mirror is +1 . What does this mean ?

32. In the given circuit, find :



(i) Total resistance of the network of resistors (ii) Current through ammeter A

33. (i) How many eggs are produced every month by either of the ovaries in a human female ? Where does fertilization take place in the female reproductive system ?
(ii) What happens in case the eggs released by the ovary are not fertilized?

SECTION-D

Question no. 34 to 36 are Long answer questions.

34. Discuss the physical properties of non-metals.

OR

Discuss the exceptions in the properties of metals and non-metals.

35. Suggest three contraceptive methods to control the size of human population. Mention two factors that determine the size of population.

OR

How do the following organisms reproduce by asexual methods?
(i) Euglena (ii) Spirogyra (iii) Ginger (iv) Chrysanthemum (v) Strawberry (vi) Mango

36. A household uses the following electric appliances:
(i) refrigerator of rating 400 W for 10 hours each day.
(ii) two electric fans of rating 80 W each for 6 hours daily.
(iii) six electric tubes of rating 18 W each for 6 hours daily.

Calculate the electricity bill for the household for month of June, if cost of electrical energy is .< 3 00 per unit.

OR

The values of current I flowing in a given resistor for the corresponding values of potential difference V across the resistor are given below:

I (ampere)	0.5	1.0	2.0	3.0	4.0
V (volt)	1.6	3.4	6.7	10.2	13.2

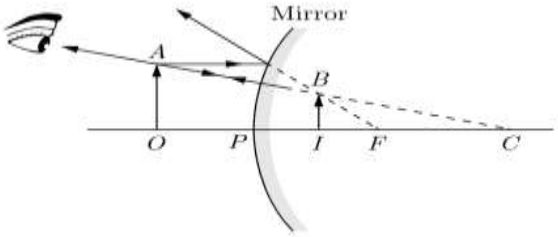
Plot a graph between V and I and calculate the resistance of the resistor.

SECTION-E

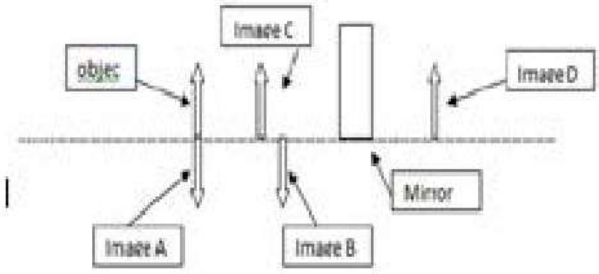
Question no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. After coming from playground, Tanu feels very hungry. But still some more time was required by her mother to cook food. While waiting on dining table Tanu was playing with her spoon. All of sudden she observed two different orientations of her face when she looked her face from both sides of spoon. She was confused why the orientation of her face changed in two cases. She was curious to know why her reflected image appears upside down in the one surface of a spoon but the correct way up in the opposite surface.

1. Which type of image is formed on the both surface of spoon?
2. As tanu move concave surface of spoon towards her face, again she find that there comes a point
3. (provided the spoon is big enough) where her image flips from inverted to upright. State the condition under which it happens ? Is this image real or virtual?
   The given ray diagram depict the correct explanation of the image formed by one surface of the spoon. Name the surface which can form the image as depicted in given ray diagram?



(iv) Tanu was trying to form image using a concave mirror. She got an inverted and real image of same size of the object. Given figure shows four possible positions of the image formed. Figure out the correct position and justify it.



38. Acids, bases and salts are three main categories of chemical compounds. These have certain definite properties which distinguish one class from the other.
The acids are sour in taste while bases are bitter in taste. Tasting a substance is not a good way of finding out if it is an acid or a base! Acids and bases can be better distinguished with the help of indicators. Indicators are substances that undergo a change of colour with a change of acidic, neutral or basic medium. Many of these indicators are derived from natural substances such as

extracts from flower petals and barrier. Litmus, a purple dye is extracted from the lichen plant. Some indicators are prepared artificially. For example, methyl orange and phenolphthalein. Given below is a table of indicators and their colour change in acidic and basic medium.

Indicator	Colour in Acid	Colour in Alkali
Litmus	Red	Blue
Methyl	Pinkish red	Yellow
Phenolphthalein	Colourless	Pink

(i) Give two examples each of natural and artificial indicators.
(ii) An aqueous solution turns red litmus solution blue. Excess addition of which solution would reverse the change-ammonium hydroxide solution or hydrochloric acid?
(iii) What will be the change in colour when a few drops of phenolphthalein is added to a solution having pH 8.5.

OR

(iv) What is universal indicator?

39. Questions are based on the two table given below. Study these tables related to blood pressure level and
answer the question that follow :

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (Upper number)	DIASTOLIC mm Hg (Lower number)
Normal	120	80
Elevated	120–129	Less than 80
High Blood Pressure (Hypertension) Stage 1	130–139	80–90
High Blood Pressure (Hypertension) Stage 2	140 or higher	90 or higher
Hypertensive crisis (consult your doctor immediately)	Higher than 180	Higher than 120

Table-B

Time of Measurement	Blood Pressure	
	Patient–X	Patient–Y
Morning	75–115	85–125
Afternoon	79–122	80–120
Evening	82–132	75–110

(i) In the table B, at which time patent–Y have ideal normal blood pressure ?
(ii) Identify the patient, which have hypertension stage-1 blood pressure ?
(iii) Which Diet is the best for high blood pressure patient ?

OR

(iv) What is the ideal blood pressure measurement of a human ?