SECTION-A

Select and write the most appropriate option out of the four options given for each of the questions 1-20. There is no negative mark for incorrect response. **20x1=20**

1. Which among the following changes are exothermic in nature? 1

   (a) Decomposition of Ferrous Sulphate

   (b) Dilution of Vinegar

   (c) Decomposition of Vegetable matter into compost

   (d) Mixing of Ammonium Chloride and Barium hydroxide

2. In order to balance the following chemical equation, the values of the coefficients x and y respectively are: 1

$$MnO_2 + x\ HC\ell \rightarrow MnC\ell_2 + y\ H_2O + C\ell_2$$

   (a) 2, 4 (b) 2, 2

   (c) 2, 3 (d) 4, 2

3. Which of the following reaction is used in black and white photography? 1

   (a) $Pb + CuC\ell_2 \rightarrow PbC\ell_2 + Cu$ (b) $2AgC\ell \rightarrow 2Ag + C\ell_2$

   (c) $CaCO_3 \rightarrow CaO + CO_2$ (d) $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$

4. Study the following table and choose the correct option: 1

Option	Salt	Parent acid	Parent Base	Nature of Salt
(a)	Ammonium Chloride	$HC\ell$	NH_4OH	Basic
(b)	Sodium Sulphate	H_2SO_4	NaOH	Acidic
(c)	Sodium Acetate	CH_3COOH	NaOH	Basic
(d)	Sodium Carbonate	H_2CO_3	NaOH	Neutr

5. Which of the options in the given table are correct? 1

Option	Natural Source	Acid present
(i)	Vinegar	Citric acid
(ii)	Nettle sting	Methanoic acid
(iii)	Tomato	Oxalic acid
(iv)	Lemon	Acetic acid

(a) (i) and (ii)

(b) (ii) and (iv)

(c) (ii) and (iii)

(d) (iii) and (iv)

6. Rings of Cartilage are present in : 1

(a) Lungs

(b) Throat

(c) Stomach

(d) Nose

7. A stomata opens when: 1

(i) it needs carbon dioxide for photosynthesis.

(ii) it does not need carbon dioxide for photosynthesis.

(iii) water flows out of the guard cells.

(iv) water flows into the guard cells.

The correct reason(s) in this process is/are:

(a) (i) only

(b) (i) and (iii)

(c) (ii) and (iii)

(d) (i) and (iv)

8. An Athlete, after a huge gap from running, suffered muscular cramps during an extensive workout session. This happened due to: 1

(a) Formation of Glucose and presence of oxygen

(b) Formation of Lactic acid and lack of oxygen

(c) Formation of pyruvate and lack of carbon dioxide

(d) Formation of ethanol and lack of oxygen.

9. Receptors are usually located in sense organs. Olfactory receptors are present in : 1

(a) Tongue (b) Eye

(c) Nose (d) Ear

10. Which of the following is not an involuntary action? 1

(a) Salivation (b) Vomiting

(c) Heart beating (d) Chewing

11. The ability of a lens to converge or diverge light rays depends on its: 1

(a) Optical Centre (b) Principal axis

(c) Image (d) Focal length

12. When an object is kept within the focus of a concave mirror, an enlarged image is formed behind the mirror. The nature of image is: 1

(a) real (b) inverted

(c) Virtual and inverted (d) Virtual and erect

13. When light rays enter the eye, most of the refraction occurs at the : 1

(a) Iris (b) Outer surface of the cornea

(c) Pupil (d) Eye lens

14. A person with an eye defect can see distant objects clearly but cannot see nearby objects distinctly. The possible cause of this defect is due to: 1

(a) Excessive curvature of the eye lens, shortening of eye ball

(b) Decrease in curvature of the eye lens, elongation of eye ball

(c) Decrease in focal length of the eye lens, elongation of eye ball

(d) Increase in focal length of the eye lens, shortening of eye ball

15. Which of the following methods of waste disposal is considered the least environmentally friendly? 1

(a) Incineration (b) Recycling

(c) Landfilling (d) Composting

16. Which of the feature relate with biodegradable substances? 1

(a) Remain inert

(b) broken down by biological processes

(c) May harm the ecosystem

(d) Persist in environment for very long duration.

Question No. 17 to 20 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.

17. Assertion (A): Potassium oxide is an amphoteric oxide. 1

Reason (R): Metal oxides which react with both acids as well as bases are known as amphoteric oxides.

18. Assertion (A): Deficiency of Growth Hormone in human beings leads to Dwarfism. 1

Reason (R): Growth hormone is secreted by Pancreas.

19. Assertion(A): Concave mirrors are used to get wider field of view in vehicles. 1

Reason (R): When a object is within focus of a concave mirror, then an enlarged image is formed.

20. Assertion (A): Food chains generally do not consists of more than four trophic levels. 1

Reason (R): There is loss of energy at each trophic level and very little usable energy remains after four trophic level.

SECTION-B

Question No. 21 to 26 are very short answer type questions.

21. Iron Nails are dipped in Copper Sulphate solution. How will you prove that chemical change has taken place here ? Support your response with two reasons. 2

22. (I) Draw a well labelled diagram of human neuron. 2

OR

(II) Name the part of brain which is responsible for following actions:

(a) Beating of heart

(b) Thinking

(c) Maintaining posture and balance

(d) Blood pressure

23. Name the Sodium compound which is used for : 2

(a) Removing permanent hardness of water

(b) Neutralising excess acid in stomach

24. (i) Why rate of breathing in aquatic organisms is much faster than terrestrial organisms? 2

(ii) Name the respiratory pigment in human beings and where it is present?

25. (A) In which eye defect crystalline lens becomes milky and cloudy? How this can be treated? 2

OR

(B) Define Dispersion. What is obtained as a result of dispersion? 2

26. Gas 'Z' is found in the upper layers of the atmosphere, is a deadly poison but is essential for all living beings. The amount of this gas started declining sharply in the 1980s. 2

(a) Identify Gas 'Z'. Why is it essential for all living beings?

(b) State the cause for the depletion of this gas layer.

SECTION-C

Question No. 27 to 33 are short answer type questions.

27. In the electrolysis of water: 3

(a) Name the gas collected at anode and cathode.

(b) Write the ratio of the volume of gas collected at each electrode.

(c) Write the chemical equation of the above reaction.

28. The given reaction shows one of the processes to extract the metals like Iron and Manganese. 3

$$MnO_2(s) + A\ell(s) \rightarrow Mn(\ell) + 2A\ell_2O_3(s) + Heat$$

(a) Give reason why the above reaction is known as a thermite reaction.

(b) Identify the substance oxidised and reduced in the above reaction.

(c) Give a reason why Aluminium is preferably used in thermite reactions.

29. List the role of each of the following in human digestive system: 3

(a) Salivary amylase

(b) Bile juice

(c) Villi

30. Name the major three regions of Human brain and write one function of each. 3

31. (I) Draw rays diagram showing the image formation by a concave mirror when an object is placed - 3

(a) Between focus and centre of curvature of the mirror.

(b) At infinity

(c) At centre of curvature of the mirror

OR

(II) List the three characteristics of image formed by plane mirror. 3

32. Draw a ray diagram to show the refraction of a ray of light through a triangular glass prism and mark on it (i) angle of incidence (*i*), (ii) angle of emergence (e), and (iii)angle of deviation (D). What would happen, if instead of a ray, a beam of white light falls on the prism? Give reason for the phenomenon that occurs in this case. 3

33. (a) State laws of refraction. 3

(b) Write one difference between convex and concave lens on the basis of nature of image.

SECTION-D

Question no. 34 to 36 are long answer type questions.

34. (I) When electricity is passed through an aqueous solution of substance 'W' it decomposes to form another substance 'X' and a gas 'Y'. Gas 'Y' is further used for manufacturing of substance 'Z' which is used to make drinking water free from germs. (a) Identify W,X,Y and Z. (b) Write the chemical equations representing formation of substances namely X, Y and Z. (c)Write one more use of substance Z. 5

OR

(II) (a) A chemical compound which is obtained from baking soda is used in removing hardness of water. (i) Identify the compound. (ii) How is this compound obtained in its crystalline form? State whether this compound is acidic/basic/neutral in nature. Justify your answer. 5

(b) Define neutralisation reaction. Give one example.

35. (I) (a) Name the process which is used by green plants to obtain their nutrition. List the raw materials required for this process. 5

(b) Write three events that occur during this process in plants.

a) through a process that involve the kidneys, ureters bladders and urethra.

OR

(II) (a) Name the organs that form the excretory system in human beings. 5

b) kidney, ureter, urethra and urinary bladder.

(b) Describe in brief how urine is produced in the human body.

36. (I) Explain the reason of the following: 5

(a) Danger signals are red in colour.

(b) Sky appear dark instead of blue to an astronaut.

(c) White light is dispersed into its seven colour by a prism.

(d) Twinkling of stars.

(e) A normal eye not able to see clearly the objects placed closer than 25cm.

OR

(II) Write down the function of following parts of Human eye: 5

(i) Retina

(ii) Iris

(iii) Eye lens

(iv) Pupil

(v) Optic nerve

SECTION-E

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

37. A metal is an element that readily loses electrons and has metallic bonds. A metal shows a lustrous appearance, good conductor of heat and electricity. They are generally sonorous, malleable and ductile. The table shows the reaction of different metals with water.

Metal	Reaction with water
A	None
B	Fast
C	Very slow
D	Vigrous

(a) Which metal(s) can displace 'C' from its salt solution? 1

(b) Which metal can displace 'B' from its salt solution? 1

(c) Which metal is likely to be displaced by 'C'? Why? 2

OR

(d) On the basis of the given table, what is the correct order of increasing reactivity of metals? Give reason. 2

38. During a busy evening in the kitchen, Maya was chopping vegetables when she accidentally cut her finger with a sharp knife. Immediately, without thinking, she withdrew her hand and applied pressure to the cut. The quick and involuntary nature of this withdrawal action prevented further damage and allowed Maya to quickly attend to her wound. Actions like these are crucial in the kitchen environment, where potential hazards such as sharp objects or hot surfaces require immediate protective responses to minimize injury.

(a) What is this above action known as? 1

(b) What is the function of receptors in the body? 1

(c) Trace the sequence of events which have occurred in the above case. 2

OR

(d) What is the difference between the ways in which movement take place in a sensitive plant and movement in our hand? 2

39. Study the data given below showing the focal length of three concave mirrors L.M and N and the respective distances of objects placed in front of the mirrors:

Case	Mirror	Focal length (cm)	Object Distance(cm)
1	L	10	25
2	M	15	30
3	N	20	10

(a) In which one of the above cases the mirror will form a diminished image of the object? Justify your answer. 1

(b) List two properties of the image formed in case 2. 1

(c) What is the nature and size of the image formed by mirror 'N'. Draw a ray diagram to justify your answer. 2

OR

(d) An object is placed at a distance of 15 cm from the pole of a concave mirror of focal length 10 cm. Find the position of the image formed in this case. 2