Subject: Science **Max. Marks: 80**

Class: X **Duration: 3 Hours**

PART–A: PHYSICS

I. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. **2 x 1 = 2**

1. The diameter of the reflecting surface of a spherical mirror is _____.
   (a) Optical center
   (b) Center of curvature
   (c) Aperture
   (d) Principal axis
2. When a 40V battery is connected across as unknown resistor, there is a current of 100mA in the circuit. The value of the resistance is _____.
   (a) 500Ω (b) 800Ω (c) 0.8Ω (d) 400Ω

II. Answer the following in a sentence each: **3 x 1 = 3**

3. What is dispersion of light?
4. State Ohm's Law.
5. What is solenoid?

III. Answer in two or three sentences: **3 x 2 = 6**

6. (a) Name the main constituent of Biogas.
   (b) Biogas plants are a boon for farmers. Why?
7. What is the position, size and nature of image formed in convex lens, when the position of the object is at $2F_1$? Draw a ray diagram for the same.
8. How does an overloading and short circuit occur in an electric circuit? Explain what is the function of a fuse in the above situation?

IV. Answer the following questions: **3 x 3 = 9**

9. An object is kept at a distance of 30cm from a diverging lens of focal length 15cm. At what distance the image is formed from the lens? Find the magnification of the image.
10. (a) Why an ammeter is likely to burn if you connect it in parallel?
    (b) Why does a series arrangement not found satisfactory for domestic lights?
11. Draw a neat, labelled diagram of an electric motor.

IV. Answer the following questions: **2 x 4 = 8**

12. A student focuses the image of a candle flame placed about 2m from a convex lens of focal length 10cm on a screen. After that he moves the flame gradually towards the lens and focuses its image on the screen each time.
    (a) In which direction does he move the lens to focus the flame on the screen?
    (b) What happens to the size of the image formed on the screen?
    (c) What differences is seen in the intensity of an image of the flame on the screen?
    (d) What is seen on the screen when the flame is very close to lens?
13. Explain briefly the defects of vision and their remedies of
    (a) Presbyopia (b) Astigmatism
    OR
    (a) Describe the process of formation of a rainbow.
    (b) Why are danger signal lights red in colour?

PART-B: CHEMISTRY

VI. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. **2 x 1 = 2**

14. The sodium salt of a long chain carboxylic acid possessing a cleansing property is
    (a) an ester (b) a detergent (c) a soap (d) a fat
15. Which of the following is a redox reaction?
    (a) $CaCO_3 \rightarrow CaO + CO_2$ (b) $ZnO + C \rightarrow Zn + CO$
    (c) $CaO + 2HCl \rightarrow CaCl_2 + H_2O$ (d) $NaOH + HCl \rightarrow NaCl + H_2O$

VII. Answer the following question. **1 x 1 = 1**

16. Which property of a metal is used to make cooking vessels?

VIII. Answer the following questions. **2 x 2 = 4**

17. (a) Write the chemical equation to show the reaction involved during manufacturing of POP?
    (b) Write the uses of plaster of paris.
18. Draw a neat diagram to show the electrolytic reduction of copper. Label pure and impure copper.

IX. Answer the following questions. **3 x 3 = 9**

19. (a) Ionic compounds in solid state do not conduct electricity, but in molten state, they are good conductors of electricity. Why?
    (b) Write the formation of Ionic bond in $MgCl_2$ with an electron dot structure.
20. Draw a neat and labelled diagram to shown the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label, zinc granule and hydrogen gas.

21. (a) How does (*a*) atomic size and (*b*) metallic property varies across the period and down the group.

(b) Noble gases are placed as zero group elements. Why?

OR

(a) State Mendeleev's periodic law.

(b) What is the basis of classification in Mendeleev's periodic table.

(c) Why Mendeleev's periodic table was considered a failure?

X. Answer the following question. **2 x 4 = 8**

22. (a) Detergents are advantageous over soaps. Justify.

(b) List out any 2 properties of Ethanol.

23. (a) Differentiate between saturated and unsaturated hydrocarbons with suitable examples.

(i) Bromopentane (ii) Ethene

PART-C BIOLOGY

XI. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.

4 x 1 = 4

24. The site of complete digestion of fat, proteins and carbohydrates is _____.

(a) Mouth (b) Stomach (c) Small Intestine (d) Large Intestine

25. The plant causes wilting of leaves is _____.

(a) Auxins (b) Gibberellins (c) Abscisic acid (d) Cytokinin

26. In a given food chain if the amount of energy at the fourth tropic level is 5kJ, what will be the energy available at the producer level.

Grass $\rightarrow$ Grass hopper $\rightarrow$ Frog $\rightarrow$ Snake $\rightarrow$ Hawk

(a) 5kJ (b) 50kJ (c) 500kJ (d) 5000kJ

27. The part of the seed which develops in a shoot system is _____.

(a) Cotyledons (b) Plumule (c) Radicle (d) Entire seed

XII. Answer the following questions. **2 x 1 = 2**

28. What is the role of decomposers in an ecosystem?

29. List any 2 methods to estimate the age of fossils.

XIII. Answer the following questions. **3 x 2 = 6**

30. Why is diffusion not sufficient to meet the oxygen requirements for multicellular organisms like humans?

31. The geographical isolation in individuals of a species lead to the formation of a new species. Justify the statement with an example.

32. Draw a neat labelled diagram of germination of pollen grains and label pollen grains and ovule.

XIV. Answer the following questions. **3 x 3 = 9**

33. (a) How does an embryo get nourishment inside the mother's body?

(b) Why are testes located outside the abdominal cavity in the scrotum.

OR

(a) How is sex determined in human beings?

(b) List out any 2 important hormones secreted by female reproductive system.

34. Explain briefly the formation of urine, with the diagram of nephron.

XV. Answer the following questions. **1 x 4 = 4**

35. Explain how Mendal showed that genes determining two different characters assort independently.

OR

(a) Differentiate between acquired trait and inherited trait with examples.

(b) What are homologous and analogous organs. Give examples.

XVI. Answer the following questions. **1 x 5 = 5**

36. Draw a neat diagram of vertical section of human brain and label.

OR

(a) Cerebellum (b) Medulla oblongata

Write any two functions of the above two parts.