

General Instructions:

- All questions are compulsory.
- The question paper comprises of **two Sections, A and B**. You are to attempt both the sections.
- All questions of **Section-A** and **Section-B** are to be attempted separately.
- There is an internal choice in three questions of three marks each, two question of five marks and one question of Practical Based Question.
- Question number **1 to 2** in **Section-A** are **one mark** question. These are to be answered in **one word** or in **one sentence**.
- Question numbers **3 to 5** in **Section-A** are **two marks** questions. These are to be answered in about **30 words** each.
- Question numbers **6 to 15** in **Section-A** are **three marks** questions. These are to be answered in about **50 words** each.
- Question numbers **16 to 21** in **Section-A** are **five marks** questions. These are to be answered in about **70 words** each.
- Question numbers **22 to 27** in **Section-B** are questions based on practical skills and are **two marks** questions.

SECTION – A

- Name the two ways in which glucose is oxidised to provide energy in various organisms.
- Why is DNA copying necessary during reproduction?
- The formula of magnesium oxide is MgO. State the formula of barium nitrate and barium sulphate, if barium belongs to the same group as magnesium.
- Distinguish between a real and a virtual image of an object. What type of image is formed (i) by a plane mirror, (ii) on a cinema screen?
- Describe how hydro-energy can be converted into electrical energy. Write any two limitations of hydro energy.
- (a) A solution of Potassium chloride when mixed with silver nitrate solution, an insoluble white substances is formed. Write the chemical reaction involved and also mention the type of the chemical reaction
(b) Ferrous sulphate when heated, decomposes with the evolution of a gas having a characteristic odour of burning sulphur. Write the chemical reaction involved and identify the type of reaction.
- A student using a convex lens of focal length 20 cm, formed image of an object placed in front of the lens on one side a screen placed on the other side of the lens. He noted the following reading for object distance (u) and image distance (v) from lens.

S.No	1	2	3	4	5	6
u (cm)	60	45	40	32	35	15
v (cm)	30	36	45	53	25	10

Without using lens formula, comment, which of these observations are wrong. Justify your answer.

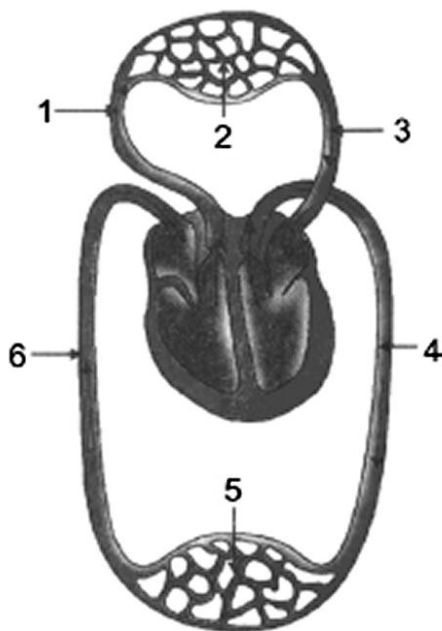
- Explain how the tendency to gain electrons change on moving down a group?

9. Explain the structure of bronchi with the help of a neat diagram and label on it (i) trachea (ii) bronchiole.

OR

(a) Label any 4 parts in the given diagram.

(b) What are the two functions represented in this diagram?



10. What is tooth enamel chemically? State the condition when it starts corroding. What happens when food particles left in the mouth after eating degrade? Why do doctors suggest use of tooth powder/toothpaste to prevent tooth decay?

OR

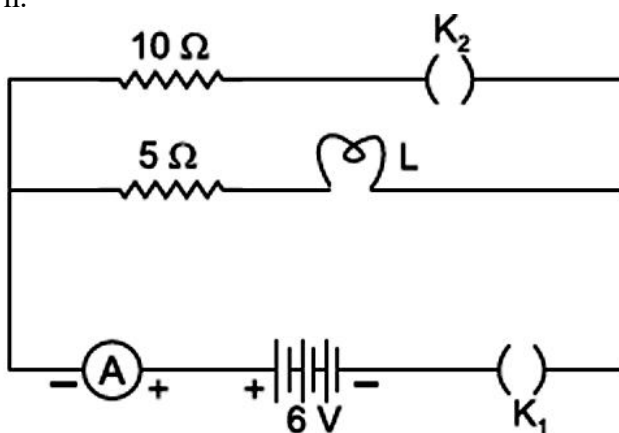
Answer the following questions:

(i) State the colour of phenolphthalein in soap solution.

(ii) Name the by-product of chlor-alkali process which is used for the manufacture of bleaching powder.

(iii) Name one indicator which specifies the various levels of H^+ ion concentration.

11. Study the circuit shown:



A current of 0.6 A is shown by ammeter in the circuit when the key K_1 is closed. Find the resistance of the lamp L. What change in current flowing through the 5 Ω resistor and potential difference across the lamp will take place, if the key K_2 is also closed. Give reason for your answer.

12. How do Mendel's experiment show that traits are inherited independently?

13. What is pollination ? How is self-pollination different from cross-pollination ?
14. Explain the use of an electric fuse. What type of material is used for fuse wire and why?

OR

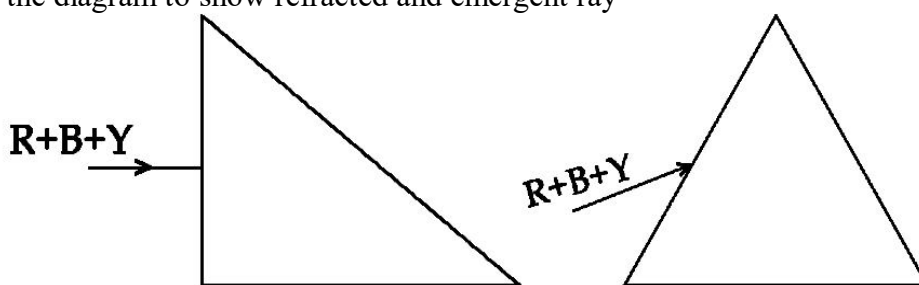
Explain the underlying principle and working of an electric generator by drawing a labelled diagram.

15. Give reasons for the following :
- Traits acquired during lifetime of an individual are not inherited.
 - All the human beings belong to a single species.
 - Variations keep on accumulating during reproduction, and do not disappear in next generation.
16. Draw a schematic diagram of the various steps involved in the extraction of metals from ores for metals of medium reactivity and for metals of low reactivity.
17. What is meant by reflex-action? With the help of a labelled diagram trace the sequence of events which occur when we touch a hot object.
18. (a) Distinguish between saturated hydrocarbon and unsaturated hydrocarbon with the help of combustion process.
 (b) Write the chemical names of C_4H_{10} and C_2H_2 and draw their structures.

OR

Soaps and detergents are both types of salts. State the difference between the two. Write the mechanism of the cleansing action of soaps. Why do soaps not form lather (foam) with hard water? Mention any two problems that arise due to the use of detergents instead of soaps.

19. (a) Define dispersion of light. How is scattering of light different from dispersion ? Give one example of natural phenomenon based on each of these.
 (b) A beam of light consisting of red, blue and yellow is incident on the prisms as shown below. Complete the diagram to show refracted and emergent ray



20. (a) What is biodiversity? What will happen if biodiversity of an area is not preserved? Mention one effect of it.
 (b) Why we say energy flow in the biosphere is unidirectional?

OR

- What is sustainable development? State its two main objectives.
- What is meant by three types of 'R' (3-R's) to save the environment? Explain with examples how would you follow the 3-R's in your school to save the environment.

21. Aishwarya once visited her uncle's house. Somehow she came to know about her uncle's illness and also about the neglect of MRI (Magnetic resonance imaging) due to its high cost. She then not only collected money from some of her family friends but also convinced her uncle for the test. The reports came after the test helped the doctors to treat him well. After getting well,

uncle arranged the money and returned to her saying thanks. Then her uncle did a brief research about the test and found that it was expensive because of its set-up, that needs a strong magnetic fields and pulses of radio wave energy.

- (a) What were the values shown by Aishwarya and her uncle ?
- (b) How the magnetic field produced due to a circular coil depends on its radius?
- (c) State the characteristics of magnetic field lines produce by current carrying circular coil.

SECTION – B

22. You have been provided with a fresh plucked leaf of Rheo or lily. What will you do to obtain the transparent leaf peel?

23. What are the factors on which the resistance of a conductor depends?

OR

While experimentally verifying Ohm's Law a student observed that the pointer of the voltmeter coincide with 15th division when the voltmeter has a least count of 0.05 V. Find the observed reading of voltmeter.

24. Write the names and molecular formula of two organic compounds having functional group suffixed as '-oic acid'. With the help of a balanced chemical equation and explain what happens when any one of them reacts with sodium hydroxide.

25. A student performed an experiment for the image formation by a convex lens at different positions of an object. If focal length of lens is 15 cm.

Match the following :

Position of object	Position of the image
(a) At 15 cm from convex lens	(a) At 30 cm from convex lens
(b) At 30 cm from lens	(b) On the same side of an object
(c) Beyond 30 cm of lens	(c) At infinity
(d) At 10 cm from lens	(d) Between 15 cm and 30 cm of lens

26. In an experiment to study the properties of Acetic acid, answer the following questions :

- (a) Name the substance which on addition to acetic acid produces carbon dioxide gas.
- (b) How carbon dioxide gas is tested in the laboratory ?

27. Correct the labelling of budding in yeast in the given diagram :

