

Time allowed: **3 hours**; Maximum marks: **90**

General Instructions:

- a) All Questions are compulsory
- b) The Question Paper consists of 42 Questions divided in to four sections A, B, C and D
- c) Section- A comprises –
 - 1 to 3 questions of one mark each
 - 4 to 6 questions of two marks each
 - 7 to 18 questions of three marks each
 - 19 to 24 questions of five marks each
- d) Section- B comprises
 - 25 to 33 questions of one mark each
 - 34 to 36 questions based on practical skills are two marks each

Section – A

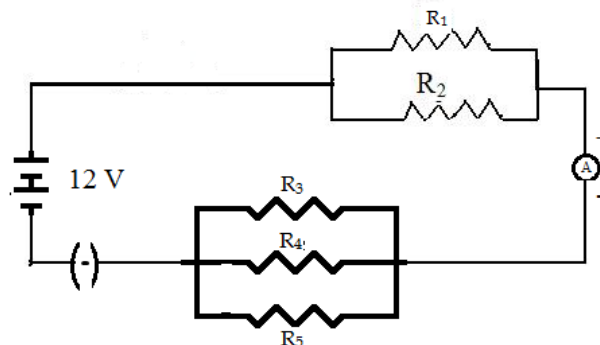
1. How is the energy released during cellular respiration used in the cell?
2. A bulb cannot be used in place of a resistor to verify ohms law. Justify this statement with reason.
3. Name any one material used to make a solar cell and also mention the range of voltage produced by a typical cell.
4. Explain the effect on the concentration of hydronium ion (H_3O^+) and pH of an acidic solution on dilution?
5. Show the formation of MgO by the transfer of electrons in the two elements using electron-dot structures.
6. Identify the plant hormone that culminates growth of shoot. Mention the condition of its synthesis and the site of its synthesis.
7. A student adds water to quicklime taken in a beaker. She/he feels the beaker turning hot. Why does this happen? Write a chemical equation for the reaction. State the type of this reaction.
8. Define the following terms :-
 - (i) Corrosion
 - (ii) Rusting
 - (iii) Rancidity

9. An element 'A' reacts vigorously with water. The product so formed, turns red litmus blue. Write the equations of reactions of the element 'A' with water and oxygen both. Write two uses of any one salt of element 'A'.
10. 10 mL of water and 5 mL of sulphuric acid are to be mixed in a beaker.
- State the method that should be followed to mix water and acid.
 - Why should this method be followed?
 - What is this process called?
11. 'Brain and Spinal Cord are two vital organs of our body'. How is our body designed to protect them?
- 12.
- Name any plant which has parasitic mode of nutrition.
 - Where are gastric glands located in alimentary canal of humans?
 - Name any two animals in which parasitic nutrition is present.
- 13.
- Write the role of motor areas in brain.
 - What is phototropism? Describe an activity to demonstrate phototropism.
14. Distinguish between alternating current and direct current. Explain why alternating current is preferred over direct current for transmission over long distances.
15. A 1.3 m long aluminum rod has square cross-section with an edge length of 2.6mm. Find the resistance between its ends. (Resistivity of aluminum is 2.26×10^{-8} ohm m).
16. Two conducting wires of the same material and equal lengths and equal diameters are first connected in series and then in parallel in an electric circuit. Find the ratio of the heat produced in series and parallel combinations.
17. "Biogas is better fuel than animal dung cakes". Justify this statement stating three reasons.
18. There was an essay writing competition in a school on the topic 'SAVE ENERGY'. The students were asked to give write ups on the topic. Nirmal could not write anything on the topic.

- (a) Give Nirmal two hints on the topic 'SAVE ENERGY?'
- (b) What changes is the school trying to bring about among its students by organising this kind of competitions?
- 19.
- (a) Mention two categories in which indicators can be placed. Write the category in which you would place methyl orange and phenolphthalein.
- (b) Two bottles 'A' and 'B' are kept on the shelf in the laboratory. How will you find out which bottle contains phenolphthalein and which bottle contains methyl orange indicator? These indicators are used to identify whether a substance is acidic or basic. Tabulate the charges shown by both the indicators with acids and bases.
20. How are the metals high up in the reactivity series obtained from their ores? Explain why they cannot be obtained by heating with carbon? Describe the process of extraction of such a metal with a suitable example. Also write balanced chemical equations.
- 21.
- (a) Draw a diagram of longitudinal section of a human heart. Name and label:
- (i) The chamber from which oxygenated blood leaves the heart
 - (ii) Vein which carries oxygenated blood.
- (b) Give reasons for :
- (i) Oxygenated and deoxygenated blood are separate in the heart of mammals
 - (ii) Ventricles are thick walled.
22. Draw the pattern of magnetic field lines through and around a current carrying solenoid. What does the magnetic field pattern inside the solenoid indicate? State how this field be utilized to make an electromagnet. List two ways by which strength of this electromagnet can be increased.
- 23.
- (a) Describe an activity to show that an electric current carrying wire behaves like a magnet.
- (b) Write two points of difference between magnetic field of a bar magnet and that of a current carrying straight conductor.

Section – B

24.



(a) Draw a schematic diagram of an electric circuit consisting of three cells of 2V each, two resistors of 5 Ω and 8 Ω in series and two resistors of 6 Ω and 4 Ω in parallel and in series in the circuit and a plug key.

(b) Given above is a circuit diagram. Find;

(i) Total resistance in circuit

(ii) Total current in circuit

25. The color of pH paper becomes green when a drop of a colorless liquid is placed on it. The liquid could be :

- (a) Water (b) diluted HCl (c) NaOH solution (d) lemon juice

26. A student took the following samples to find out their pH using pH paper. The teacher remarked that he will not be able to find the pH of one of the samples because it was not taken in proper form. The teacher was referring to :

- (a) diluted HCl (b) lemon juice
(c) Washing soda powder (d) soap solution

27. Rohit wanted to identify whether the liquid given to him in the test tube was HCl or NaOH. He added a small amount of solid sodium carbonate to it. He observed that a gas evolved with

effervescence. On the basis of this observation his correct conclusion will be that the gas evolved is-

- (a) Cl_2 so it is HCl
- (b) H_2 so it is NaOH .
- (c) CO_2 so it is HCl
- (d) CO_2 so it is NaOH .

28. Two beakers A and B contain aqueous solutions of iron sulphate. A student places a copper plate in beaker A and a zinc plate in beaker B. After sometime he observes a grey deposit on zinc plate and not on the copper plate. From these observations he may draw the following conclusion:

- (a) Zn is most reactive metal followed by Fe and Cu
- (b) Zn is most reactive metal followed by Cu and Fe
- (c) Fe is most reactive metal followed by Zn and Cu
- (d) Fe is most reactive metal followed by Cu and Zn

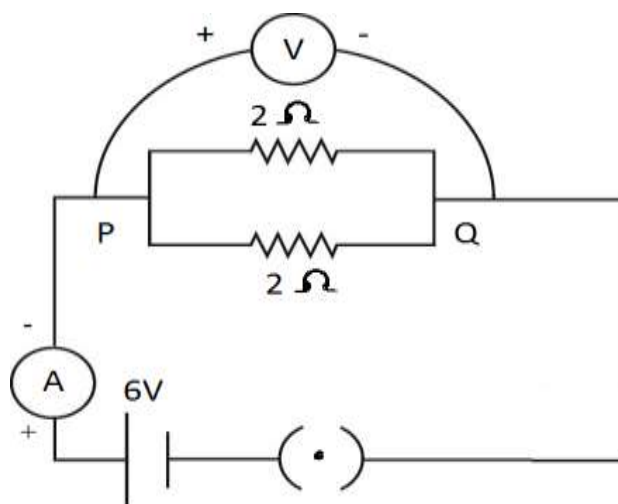
29. Geeta added a strip of Al metal to 5mL of a solution of CuSO_4 in a test tube. The correct observation made by her for change in color of solution is :

- (a) Blue solution turned colorless
- (b) Colorless solution turned blue
- (c) Pale green solution turned blue
- (d) Colorless solution remained colorless.

30. For a fixed supply voltage Ritu wants to decrease the current flowing through a conductor. She can do so by -

- (a) Increasing cross-sectional area of the conductor
- (b) Increasing length of the conductor
- (c) Reducing length of the conductor
- (d) Increasing cross-sectional area and decreasing the length of the conductor

31.



While performing the experiment to find equivalent resistance of a combination of resistances in the circuit shown above; Reena measured reading of voltmeter 'V' which gives potential differences between P and Q. She should find the reading to be :

- (a) 2 V (b) 4 V (c) 6 V (d) 8 V

32. In submerged water plants (e.g., hydrilla)

- (a) Light is not needed for photosynthesis
(b) Photosynthesis does not occur
(c) Light is necessary for photosynthesis
(d) Carbon dioxide is not required for photosynthesis

33. In the experiment to show that CO_2 is released during respiration, the solution in the test tube is chemically :

- (a) NaOH (b) KOH (c) NaCl (d) KCl

34. Ritwik performed the experiment of decomposition of Ferrous Sulphate crystals.

- a. Write the color of crystals before and after decomposition.
b. Write the formula of gaseous products obtained as a result of decomposition.

35. Usha was given a $100\ \Omega$ resistance, a 3 V battery a voltmeter and a key. She has to choose an ammeter among the four given of different ranges – 0-1A, 0-3A, 0-5mA, 0-1mA, so as to verify the resistance of given resistor. Find out which ammeter should be chosen by her and why?
36. You prepared temporary mount of leaf peel to observe stomata. Draw the diagram of closed stomata and mention the condition under which a plant closes them.