

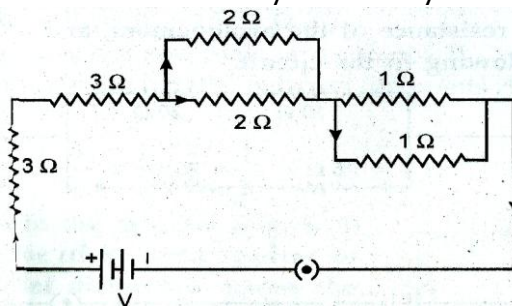
General Instructions :

1. All questions are compulsory.
2. There is no overall choice.
3. Marks for each question are mentioned against the questions.

**Section - A**

1. Write any two limitations of extracting energy from wind. (1)
2. If 'n' electrons each carrying a charge 'e' flowing through a metallic wire in time 't' from east to west then write an expression for electric current I and give its S.I. Unit and direction of current. (2)
3. Differentiate resistance and resistivity. An aluminum wire has radius 0.49 mm and length 77 m. If resistance is 10 Ω, calculate resistivity. How does resistivity change if wire is double on itself. (3)
4. State Joule's law of heating. Draw a circuit diagram to show parallel connection of 12Ω & 8Ω resistances to a source. If power dissipated in 12Ω resistance is 6W then, find power dissipated in 8Ω resistance. (3)
5. Give reasons for following:- (3)
  - a) AC is preferred over DC.
  - b) We should use 3 pin sockets for electrical appliances having a metallic body.
  - c) Solenoid is equivalent to a bar magnet.
6. (3)
  - a) What is geothermal energy?
  - b) What are the advantages of nuclear energy?
  - c) Why are we looking at alternative sources of energy?
7. What is a fuse? On what principle does it work? (3)
 

An electric oven of 1.5KW power rating is operated in a domestic electric circuit of 220V that has current rating of 5A. What result do you expect? Explain why this happen and what precautions should be taken to avoid this.
8. Government had decided to install a hydro power plant at a suitable site on a river in a remote hilly village. Villagers started propaganda that water released from hydro power plant will be harmful for drinking and watering plants. Being science student how will you convince them this project is for their benefit. Explain. Is hydropower exhaustible or non-exhaustible source of energy? Justify. (3)
9. (3)
  - a) Derive an expression for equivalent resistance of three resistors  $R_1, R_2, R_3$  connected in parallel to a source V.
  - b) Find (i) Equivalent resistance of the circuit. (ii) Potential difference applied to the circuit. (iii) Current through 2 Ω resistors in the following circuit if the current delivered by the battery is 1A. (2)



10. (2)
  - a) Write any two characteristics of magnetic field lines. Draw magnetic field lines of a circular coil carrying current.
  - b) Two circular coils A & B are placed close to each other. If current in coil A is changed then will the current be induced in coil B? Explain with diagram. Name the phenomena involved and state the law used for direction of induced current. (3)

**SECTION - B**

11. Oil and fats containing food items are flushed with nitrogen. Why? (1)
12. Write a balanced chemical equation for the reaction of red hot iron with steam. (1)
13. Four solutions A, B, C and D when tested with universal indicator showed pH as 4, 1, 11, 9 respectively. Which solution is  
 a) strongly alkaline? b) weakly acidic?  
 c) Arrange the pH in increasing order of hydrogen ion concentration. ( $\frac{1}{2} + \frac{1}{2} + 1$ )
14. Give an example of: ( $\frac{1}{2} \times 4 = 2$ )  
 a) Lustrous non-metal b) Soft metal  
 c) Amphoteric oxide d) Alkali
15. Complete and balance the given equations: (1x3=3)  
 a)  $\text{Na}_2\text{CO}_3 + \text{HCl} \rightarrow$   
 b)  $\text{NaOH} + \text{Zn} \rightarrow$   
 c)  $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow$
16. a) Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write the chemical equation involved.  
 b) A small amount of ferrous sulphate was heated in a hard glass test tube.  
 i) Write the equation involved in the above reaction.  
 ii) What type of reaction is taking place? (1+2)
17. a) Why do ionic compounds have high melting point?  
 b) Show the formation of  $\text{Na}_2\text{O}$  by transference of electrons. (At. No. Na=11, O=8)  
 c) Write the constituent elements present in solder alloy. What is its use? (1+1+1)
18. a) Write an equation in which energy is supplied in the form light.  
 b) Define Oxidation reaction and give an example.  
 c) Translate the following statement into a chemical equation:- Barium chloride reacts with aluminium sulphate to give aluminium chloride and barium sulphate.
19. a) 'Enrichment of ore' Explain the term.  
 b) What is thermite reaction? Write its use.  
 c) Define calcinations. Name an ore for which calcination can be used in metallurgy.  
 d) Name the method involved to extract metals placed  
 i) Low in the activity series ii) Top in the activity series.  
 e) Draw neat and labelled diagram (only) to show the refining of copper metal. (1x5)
20. a) Why does dry HCl gas not change the colour of the dry litmus paper?  
 b) While diluting an acid, why is it recommended that the acid should be added to water and not water to acid.  
 c) Write any two uses of Washing Soda.  
 d) What is the chemical formula for plaster of paris? Write its chemical name also.  
 e) Name the acids present in a) Antsting b) Curd. (1x5)

**SECTION - C**

21. Differentiate between aerobic respiration and anaerobic respiration. How are the alveoli designed to maximize the exchange of gases? (3)
22. Explain the structure of a functional unit of nervous system with the help of a labelled diagram. What is the function of cerebrum? (3)
23. What are phyto hormones? How is abscisic acid different from cytokinins? What is tropism? Give any two examples of tropism. (5)
24. Draw a labelled cross sectional view of heart and explain double circulation pathway. State two structural differences between an artery and a vein. (5)



31. Boiling of green leaves in water removes: (1)  
 a) Water                      b) CO<sub>2</sub>                      c) starch                      d) Chlorophyll.

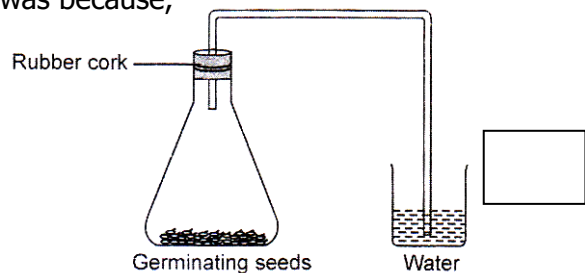
32. The steps necessary for setting up the experiment, "To demonstrate that light is necessary for photosynthesis" are not given here in proper sequence. (1)  
 I. Keep the potted in sunlight for 3 to 4 hours.  
 II. Keep the potted plant in darkness for about 48 hours.  
 III. Cover a leaf of the plant with a strip of black paper.  
 IV. Pluck the leaf and test it for starch.  
 The correct sequence of steps is:  
 a) I, III, IV, II                      b) I, IV, III, II                      c) II, IV, III, I                      d) II, III, I, IV

33. The teacher instructed a student to place a healthy potted plant in a dark room for 24 hours prior to one experiment on photosynthesis. The purpose of placing it in dark room is (1)  
 a) To increase the intake of CO<sub>2</sub>  
 b) To activate the chloroplast ion the leaves  
 c) To destarch the leaves  
 d) To denature the enzymes in the leaves.

34. If you are provided with 3 resistors of 2 Ω, 3 Ω, 6 Ω & 6 V source then the maximum possible value of current in circuit is (2)  
 a) 1 A                      b) 6 A                      c) 6/11 A                      d) 60 A

35. A) The reaction between calcium oxide and water is an exothermic reaction which is also as (2)  
 a) Combination reaction                      b) Decomposition reaction   
 c) Displacement reaction                      d) Precipitation reaction  
 B) Barium Chloride solution and Sodium Sulphate solution respectively appears as   
 a) Blue and green                      b) Yellow and colourless  
 c) Green and yellow                      d) both colourless.

36. A. The following experiment was set up to show that a gas is given out during respiration. But there was no rise in the level of water. This was because, (1)  
 a) germinating seeds have not been kept under water in the flask.  
 b) Water is kept in the beaker instead of lime water.  
 c) The cork on the flask is made of rubber.  
 d) No substance is kept in the flask to absorb the gas given out by the seeds.



B. What are precautions which should be taken in the equipment to show that CO<sub>2</sub> is produced during respiration? (2)  
 a) Apparatus should be air tight and the end of the delivery tube in the flask should not touch the germinating seeds.   
 b) The other end of the delivery tube should dip into water.  
 c) The germinating seeds should be kept moist and should not be let dry.  
 d) All of the above.