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

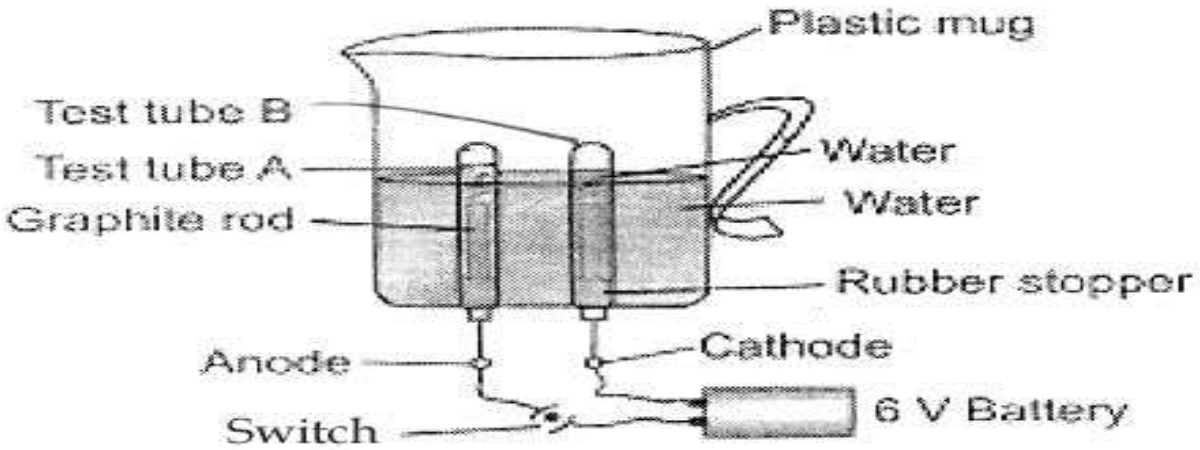
General Instructions:

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 7 questions of two marks each
   8 to 19 questions of three marks each
   20 to 24 questions of five marks each
d) Section- B comprises
   25 to 42 questions of one mark each

Section – A

1. State the change in the strength of magnetic field at a point when it is moved away from the conductor carrying current.
2. Where will you find gustatory and olfactory receptors in the human body?
3. List any two limitations in harnessing wind energy.
4. Silver chloride when kept in sunlight on decomposition produces silver and chlorine. Give balanced equation for the reaction and state its application. Name one compound which also behaves in the same way.
5. What are metal oxides? List two examples to justify your answer.
6. Name the instruments used for measuring electric current and potential difference. Draw a circuit diagram to show how these two are connected in an electric circuit.
7. What is induced current? State the rule used to find the direction of induced current.
8. Name the substance oxidized and the substance reduced in each of the following reactions :
   (i) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
   (ii) $3MnO_2 + 4Al \rightarrow 3Mn + 2Al_2O_3$
   (iii) $H_2S + SO_2 \rightarrow S + H_2O$

9. Look at the figure given below and answer the following questions :



I. Out of the two test tubes A and B identify the tube that contains hydrogen gas.

II. If the volume of hydrogen gas collected is 10 mL, what will be the volume of oxygen collected?

III. State the purpose of adding a few drops of dil. sulphuric acid to the water in plastic mug.

10. Describe an activity to prove that all hydrogen containing compounds such as alcohols and glucose are not acids.

11. A metal M is found in nature as its carbonate ore, it is used in galvanization of iron articles. Identify M and name its ore. How is M extracted from this ore? Explain with equation for the reactions involved.

12. An electric bulb is rated 220V and 100W.
    a) Find its resistance.
    b) Calculate the energy consumed by bulb in a month of 30 days if it is operated on 220V daily for 10 hours. Find the cost of energy consumed at the rate of Rs 5/- per unit of electricity.

13. Describe an activity to show the dependence of resistance of a conductor on its material.

14.
    a) Rekha draws magnetic field lines close to the axis of a current carrying circular loop. As she moves away from the center of the circular loop she observes that, the size of concentric circles goes on increasing. Explain her observation.
    b) Write two properties of magnetic field lines.

15. List three events that occur during photosynthesis.
16. Trace the events in correct sequence by which adrenaline prepare the body for running or fighting in scary situations. Name the endocrine gland that secretes this hormone and also state its location.
17. How does auxin regulate phototropism in plants? Explain the events for growth of a tendril of a climber around an object.
18.
    a) List any two criteria for selecting a good fuel.
    b) Explain how does burning of fossil fuels cause air and soil pollution.
19. During night in the month of June when coolers and fans were being used in three rooms in Ramesh's house, fuse got blown off. Ramesh replaced it with another one but that too got blown off. He then peeled off the plastic covering of the connecting copper wires. He took a large number of its thin strands and twisted them into a thick one. He decided to put it in the fuse; but his elder brother Lokesh immediately stopped him and explained why he must not use it. Ramesh was convinced to first find the fault in domestic line and then replace the fuse of correct value.

    Now answer the following questions:

    (i) What motivated Lokesh to check Ramesh from putting the wrong fuse? Mention any two qualities reflected in his behavior.

    (ii) What might have happened if Ramesh replaced the fuse with thick twisted copper wire? Give one reason to justify that only fuse of rated value should be used.
20.
    a) In what forms are metals found in nature? With the help of examples, explain how metals react with oxygen and water. Write chemical equation for the reaction.
    b) Aluminum does not corrode like iron. Why?
    c) Corrosion of iron is prevented by coating it with a layer of oil, grease or paint. Why?
21.
    a) With the help of a labelled diagram demonstrate an experiment to show the reaction between sodium carbonate and dilute hydrochloric acid.
    b) Name the gas evolved.

c) Suggest the test for the gas evolved.

d) Write equation for the chemical reactions involved.

22. Three resistors of resistances R_1, R_2 and R_3 are connected in parallel to a source of potential difference V. Draw the schematic circuit diagram. Find the equivalent resistance of the circuit. What is the advantage of joining electrical gadgets in parallel combination?

23. Draw the patterns of field lines due to solenoid carrying electric current. Mark north and south poles in the diagram. Write two important features of the magnetic field due to solenoid. What is an electromagnet?

24.

(i) Draw a diagram of human alimentary canal and label the following parts.

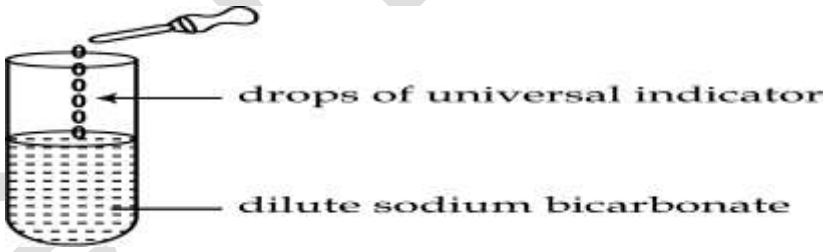
(a) Oesophagus (b) Liver

(c) Small intestine (d) Pancreas

(ii) Bile does not contain any enzyme but it is essential for digestion, give reason.

Section – B

25. A dilute solution of sodium bicarbonate is taken in a test tube and a few drops of the universal indicator is added to it.



The color observed will be:

(a) Blue (b) yellow (c) orange (d) green

26. A student dips pH papers in solution X and Y and observes that the pH paper turns blue and orange respectively in them. He infers that :

(a) X is HCl solution, Y is NaOH solution

(b) X is acetic acid, Y is sodium carbonate solution

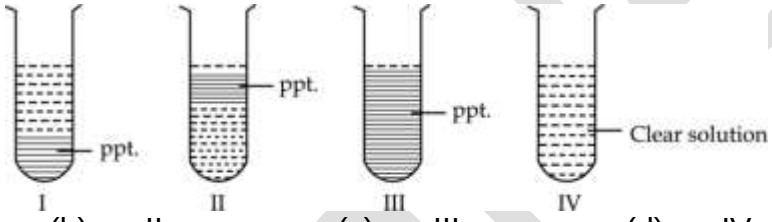
(c) X is sodium carbonate solution, Y is acetic acid

(d) X is oxalic acid, Y is sodium carbonate solution

27. 10 mL of HCl and 10 mL of NaOH solutions are contained in two separate beakers labeled I and II respectively.
On adding zinc granules to both, it is observed that at room temperature:
(a) Gas is evolved in beaker II but not in beaker I
(b) No gas is evolved in either of the two beakers
(c) Gas is evolved vigorously in both
(d) Gas is evolved vigorously in beaker I but not so in beaker II.

28. Aluminum strip was placed in a solution of copper sulphate. After one hour, it was observed that the color of solution changes. The color of solution would become.
(a) Light green (b) colorless
(c) Dark brown (d) deep blue

29. On mixing aqueous solutions of sodium sulphate and barium chloride, the correct observation is shown in test tube.

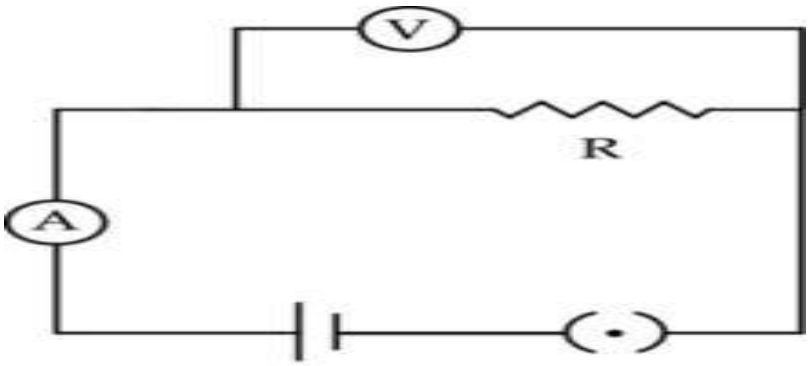


(a) I (b) II (c) III (d) IV

30. Freshly prepared iron sulphate solution was taken in each of four test tubes. Strips of Cu, Fe, Zn and Al were separately introduced in different test tubes, a black residue was observed in two test tubes. The pair of metals forming the residue is :
(a) Cu and Zn (b) Al and Cu
(c) Fe and Al (d) Zn and Al

31. A student added a piece of zinc metal to four test tubes I, II, III, IV which respectively contain aqueous solution of aluminum sulphate, zinc sulphate, ferrous sulphate and copper sulphate. In which solution he observed that the reaction has taken place.
(a) I, II (b) II, III (c) III, IV (d) I, IV

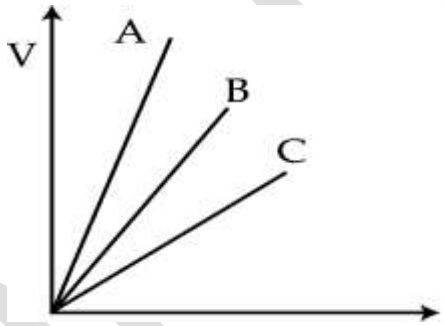
32. The number of division in ammeter of range 2A is 10 and voltmeter of range 5 V is 20. When the switch of the circuit given below is closed, ammeter reading is at 8^{th} division and voltmeter reading is at 8^{th} divisions. The value of resistance of resistor is –



(a) 1.25 ohm (b) 2 ohm (c) 0.75 ohm (d) 1.5 ohm

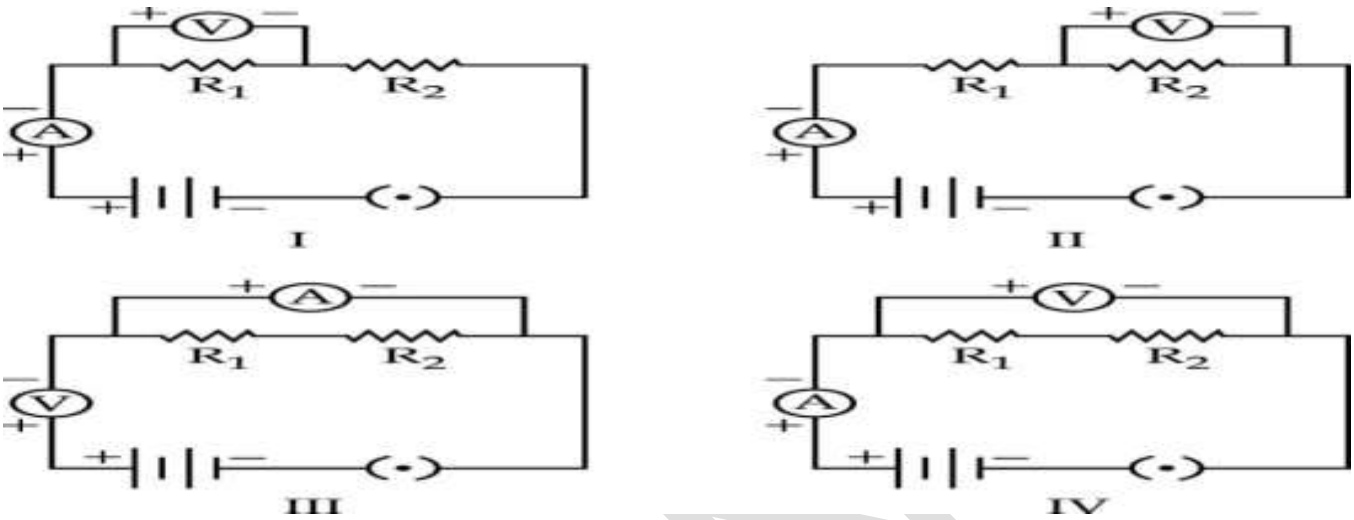
33. In Ohm's law experiment, the physical quantity/quantities which is/are to kept constant while doing experiment is/are :
    (a) Potential difference (b) current
    (c) Temperature (d) potential difference, current, temperature

34.



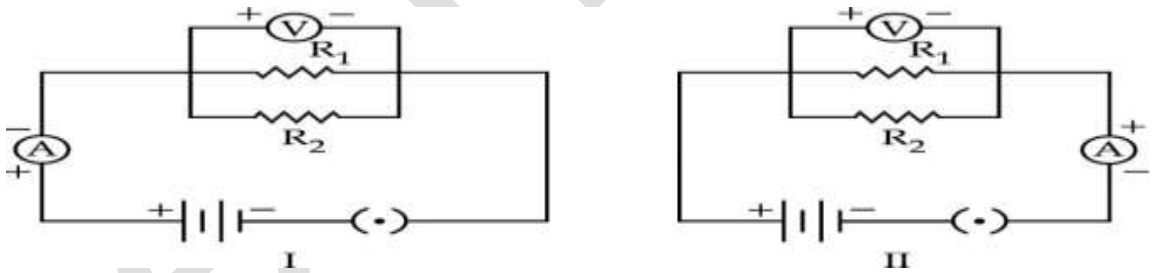
Ohm's law experiment is performed separately with individual resistors R_1, R_2 [R_1>R_2] and series combination of R_1, R_2. Graph is plotted between potential difference (V) and current (I) as shown in figure for each case:
Identify which one is for R_1, R_2 and combination of resistors?
In the graph A, B and C respectively represent
(a) R_1, R_2 and series combination
(b) Series combination, R_2, R_1
(c) R_2, R_1 and series combination
(d) Series combination, R_1, R_2

35. In the experiment on finding the equivalent resistance of two resistors, connected in series, the voltmeter across the combination is connected correctly only in circuit.



(a) I (b) II (c) III (d) IV

36. In the experiment 'To find the equivalent resistance of two resistors, connected in parallel' two students connected the ammeter in two different ways as shown in the given circuits I and II. The ammeter has been correctly connected in :



(a) Circuit I only (b) Circuit II only
(c) Both the circuits I and II (d) neither I nor II

37. A drop of glycerin is used to prepare a temporary mount of leaf peel to show stomata so that
(a) Material may stick on the slide
(b) Visibility of the material becomes clearer
(c) Material is not attacked by the bacteria
(d) Material may not get dried up

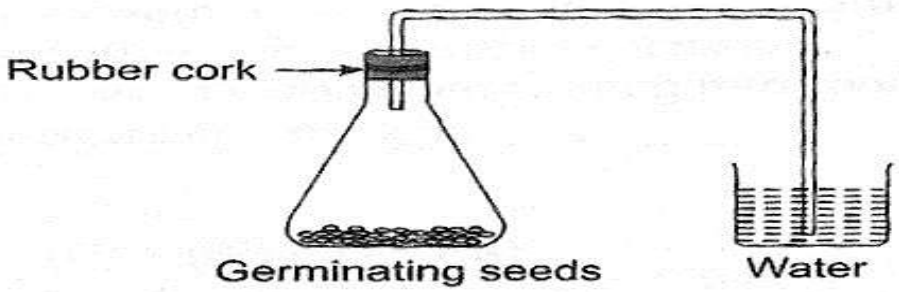
38. While preparing the temporary mount of leaf peel, the cover slip should be placed gently.
    (a) to avoid air bubbles
    (b) for removal of excess stain
    (c) to stain the leaf peel properly
    (d) for spreading the material evenly

39. Steps for the experiment to show that light is necessary for photosynthesis is given below. Which out of the following is the correct sequence of the steps for conducting the experiments successfully?
    (i) Cover a portion of the leaf on both sides with a strip of black paper.
    (ii) Destartch leaf of the potted plant.
    (iii) Pluck the destarched leaf from the potted point
    (iv) Expose the plant to sunlight for six hours.
    (v) Test the leaf for the presence of starch by dipping it in iodine solution.
    (vi) Remove the black paper strip from the leaf.
    (vii) Boil the leaf in alcohol over water bath.

    (a) (ii), (i), (iv), (vi), (iii), (vii), (v) (b) (ii), (i), (vi), (iii), (vii), (v), (iv)
    (c) (ii), (i), (vi), (iii), (v), (vii), (iv) (d) (i), (ii), (vi), (iii), (v), (vii), (iv)

40. Three students A, B and C conducted the experiment on light is necessary for photosynthesis. Student A covered a portion of the destarched leaf with black opaque paper, student B covered the destarched leaf with red opaque paper, and student C covered the destarched leaf with colorless transparent paper. When leaf turned completely blue black?
    (a) Leaf covered with black opaque paper.
    (b) Leaf covered with red opaque paper.
    (c) Leaf covered with colorless transparent paper.
    (d) Leaf covered with black and red opaque paper.

41. 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 in the tube. This was because,



    (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.

42. What are precautions which should be taken in the experiment to show that CO_2 is produced during respiration?
    (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.