Sample Question Paper I

Time: 1 ½ hours Maximum Marks: 20

INSTRUCTIONS

1. *Attempt all questions.*
2. *There are 30 multiple choice questions in total. Only one of the options in every question is correct.*
3. *The question paper consists of two parts – Section A and Section B. Each of the 20 questions in Section A carries 0.5 mark and each of the 10 questions in Section B carries 1.0 mark.*

SECTION - A

1. The two colours seen at the extreme ends of the pH chart are

   (a) red and blue.
   (b) red and green.
   (c) green and blue.
   (d) orange and green.

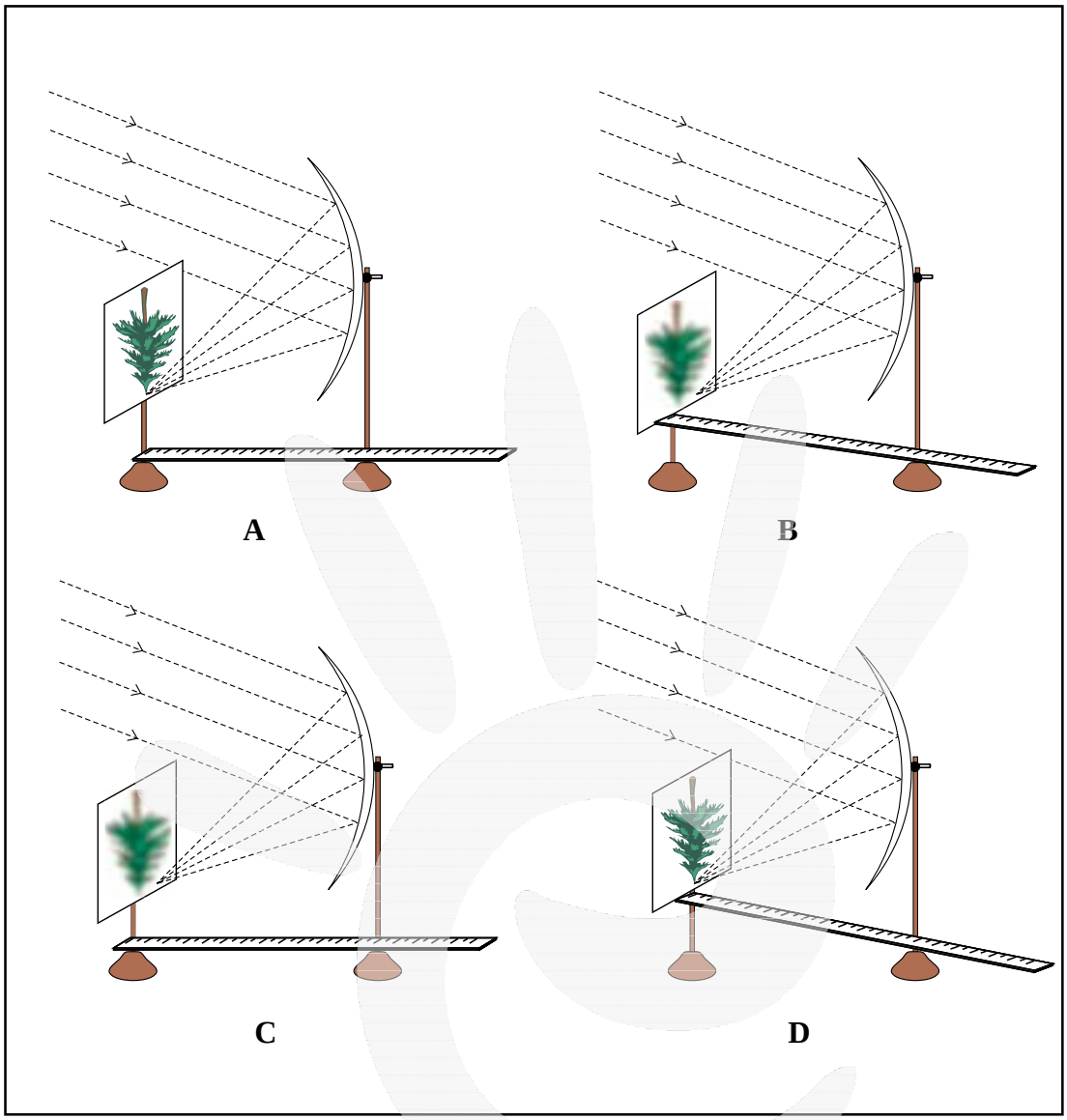
2. A student observed that the colour of pH paper changes to green when she dipped it in water. She added a few drops of concentrated hydrochloric acid to the water. The colour of pH paper would turn to

   (a) light red.
   (b) apple green.
   (c) dark blue.
   (d) lemon yellow.

3. When zinc reacts with dilute hydrochloric acid

   (a) the surface of zinc becomes brighter.
   (b) the surface of zinc becomes black and dull.
   (c) the metal turns into powder.
   (d) the reaction mixture turns green.

4. Four students A, B, C and D carried out measurements of focal length of a concave mirror as shown in the four diagrams.



The best result will be obtained by student

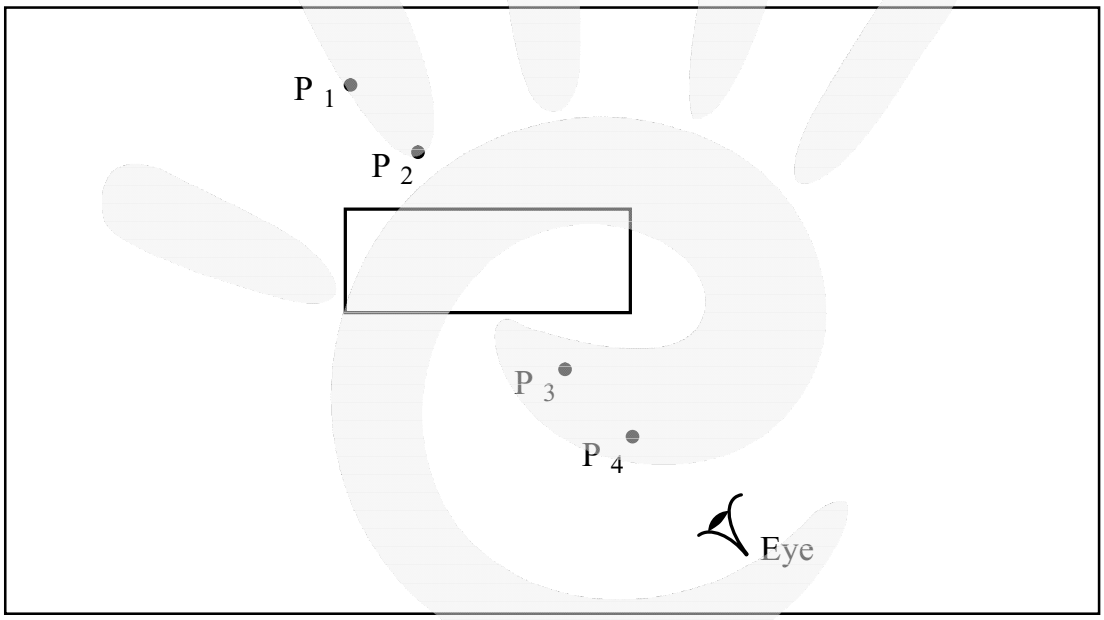
(a) A.
(b) B.
(c) C.
(d) D.

5. Three students measured the focal length of a convex lens using parallel rays from a distant object. All of them measured the distance between the lens and the inverted image on the screen.
Student A saw a sharp image on the screen and labelled the distance as f1.
Student B saw a slightly larger blurred image on the screen and labelled the distance as f2.

Student C saw a slightly smaller blurred image on the screen and labelled the distance as f3.
The relation between the three measurements would most likely be

(a) f1 = f2 = f3.
(b) f1 < f2 and f3.
(c) f3 < f1 < f2.
(d) f1 < f2 and f1= f3.

6. In the glas slab experiment shown below, four students A, B, C and D did the following:
A: kept the eyes far from the glass slab while placing both the pins P_3 and P_4.
B: kept the eyes close to the glass slab while placing both the pins P_3 and P_4.
C: kept the eyes close to the glass slab while placing pin P_3 and far from the slab while placing pin P_4.
D: kept the eyes far from the glass slab while placing pin P_3 and close to the slab while placing pin P_4.

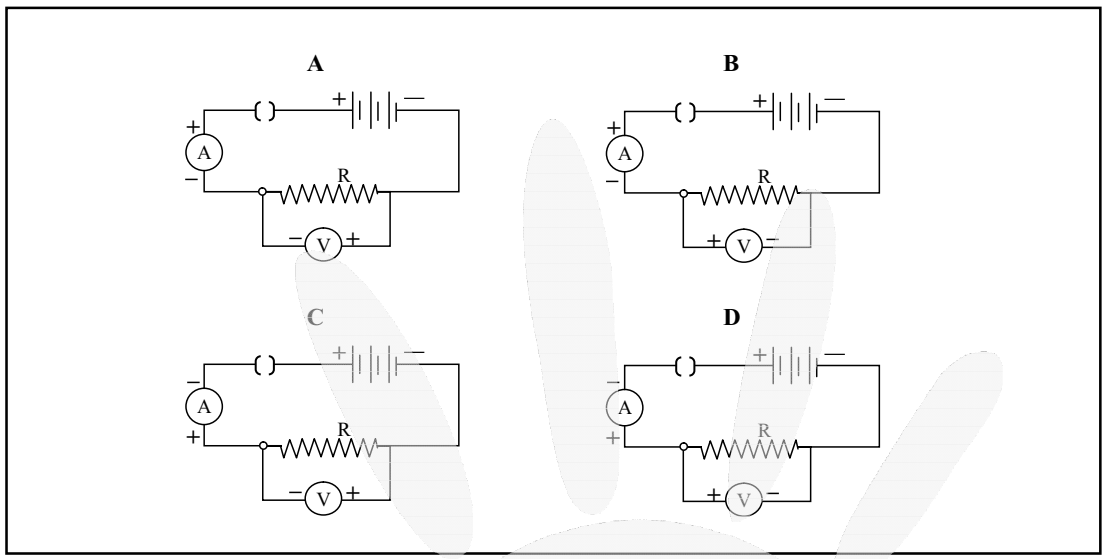


The correct procedure is that of student

(a) A.
(b) B.
(c) C.
(d) D.

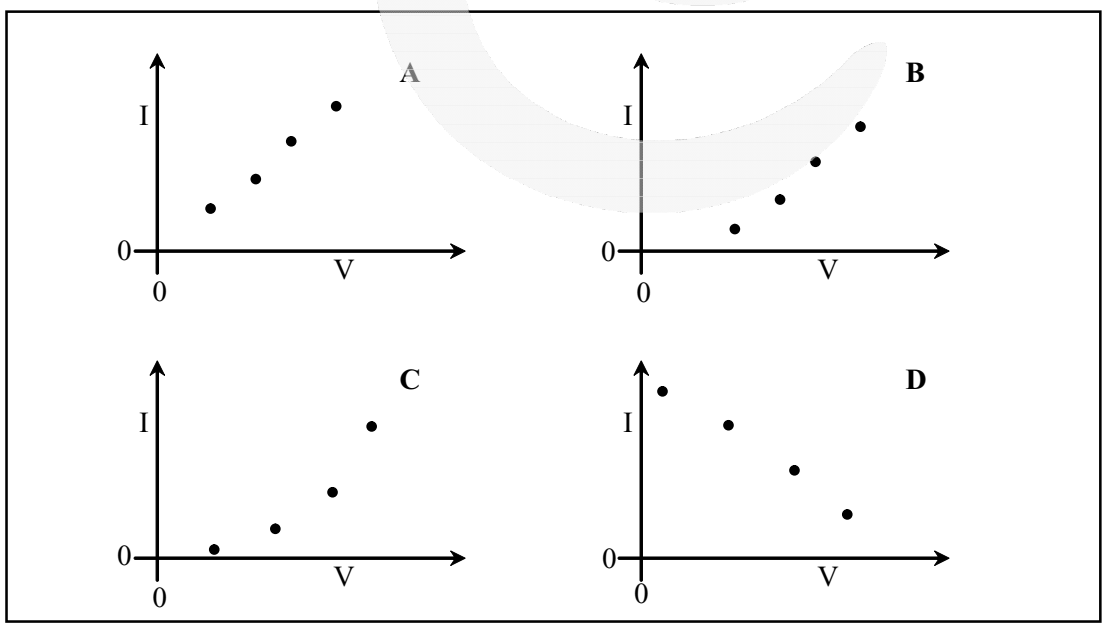
7. Out of the four circuits shown for studying the dependence of the current on the potential difference across a resistor, the correct circuit is

(a) A.
(b) B.
(c) C.
(d) D.



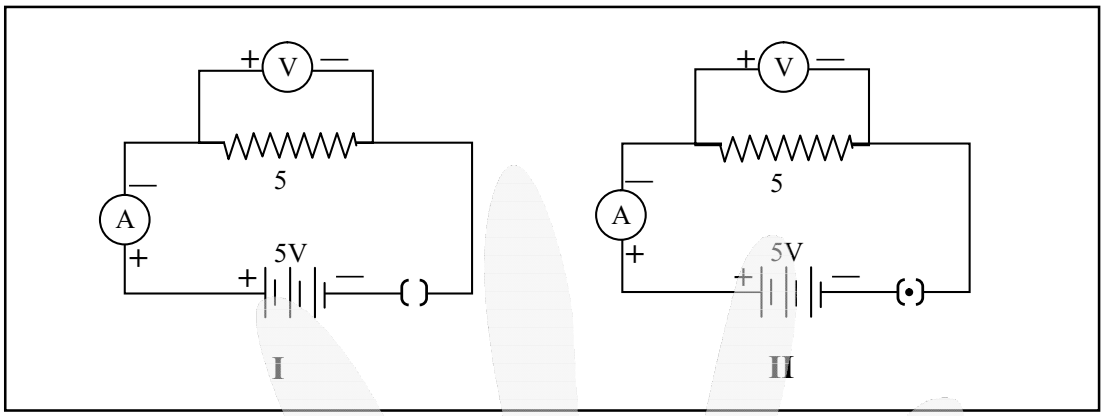
8. The plot correctly showing the dependence of the current I on the potential difference V across a resistor R is

(a) A.
(b) B.
(c) C.
(d) D.



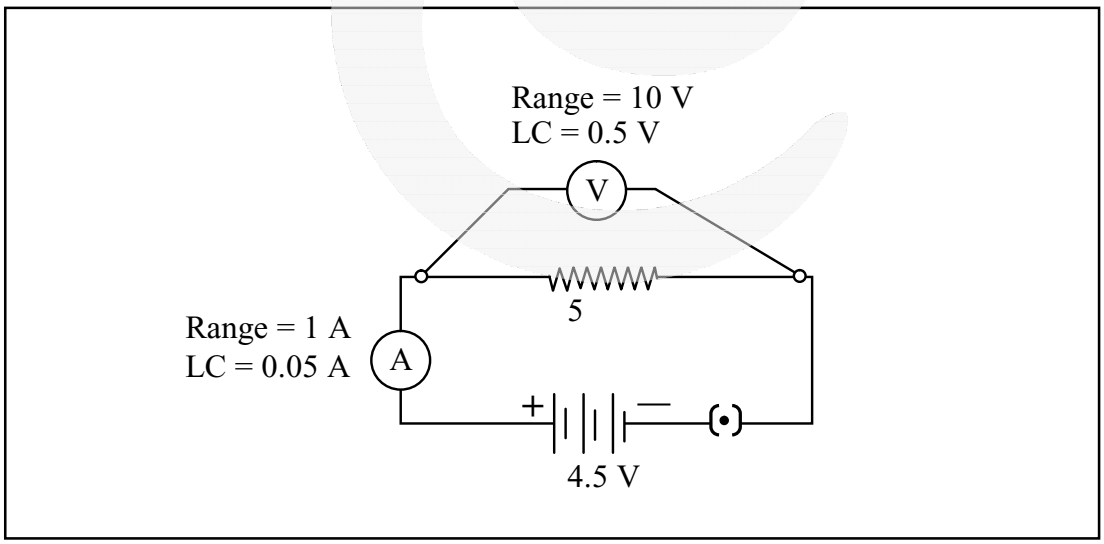
9. For the circuits shown in figures I and II, the ammeter readings would be

(a) 1 A in circuit I and 0A in circuit II.
(b) 0 A in both circuits.
(c) 1 A in both circuits.
(d) 0 A in circuit I and 1 A in circuit II.

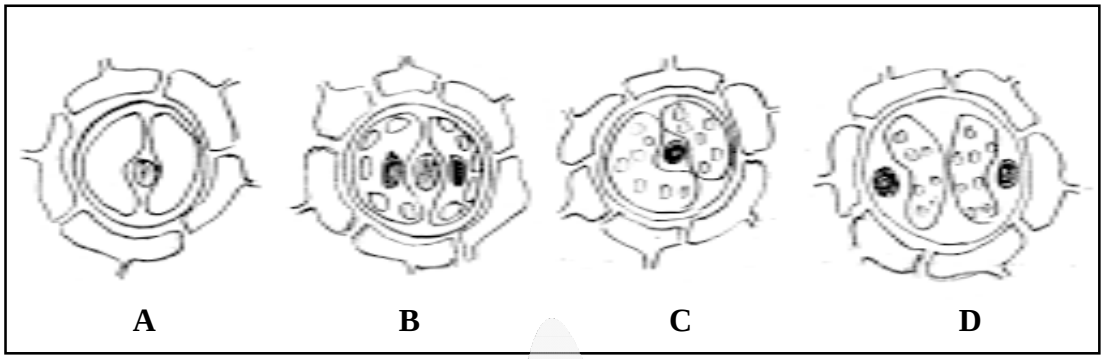


10. The voltmeter, ammeter and resistance in the circuit shown have been checked to be correct. On plugging the key, the ammeter reads 0.9 A, but the voltmeter reads zero. This could be because

(a) the range of the voltmeter is more than the twice the battery voltage.
(b) the least count of the voltmeter is too high.
(c) the wires joined to the voltmeter terminals are loose.
(d) the voltmeter is incorrectly placed in the circuit.



11. Students observed the epidermal peel of a leaf under the high power of a microscope. The following are the sketches made by them.



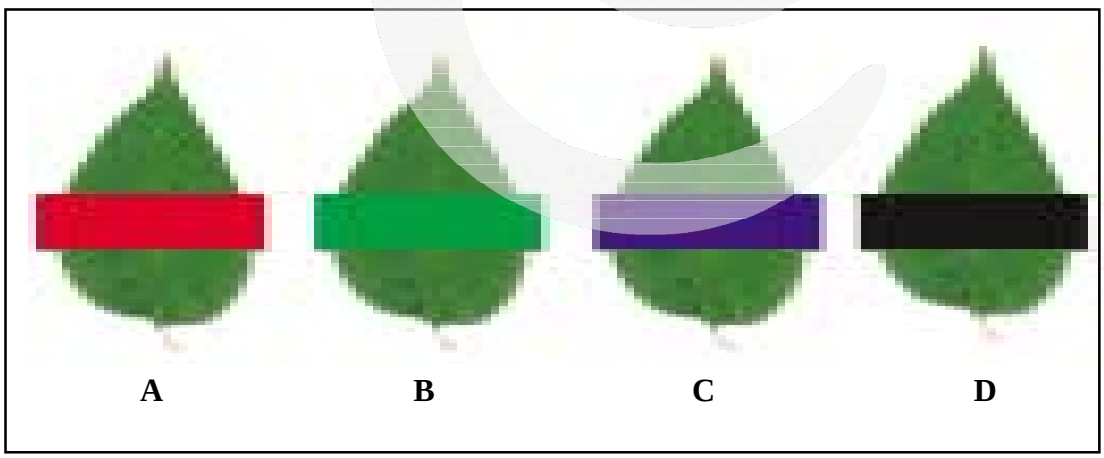
The correct sketch is

(a) A.
(b) B.
(c) C.
(d) D.

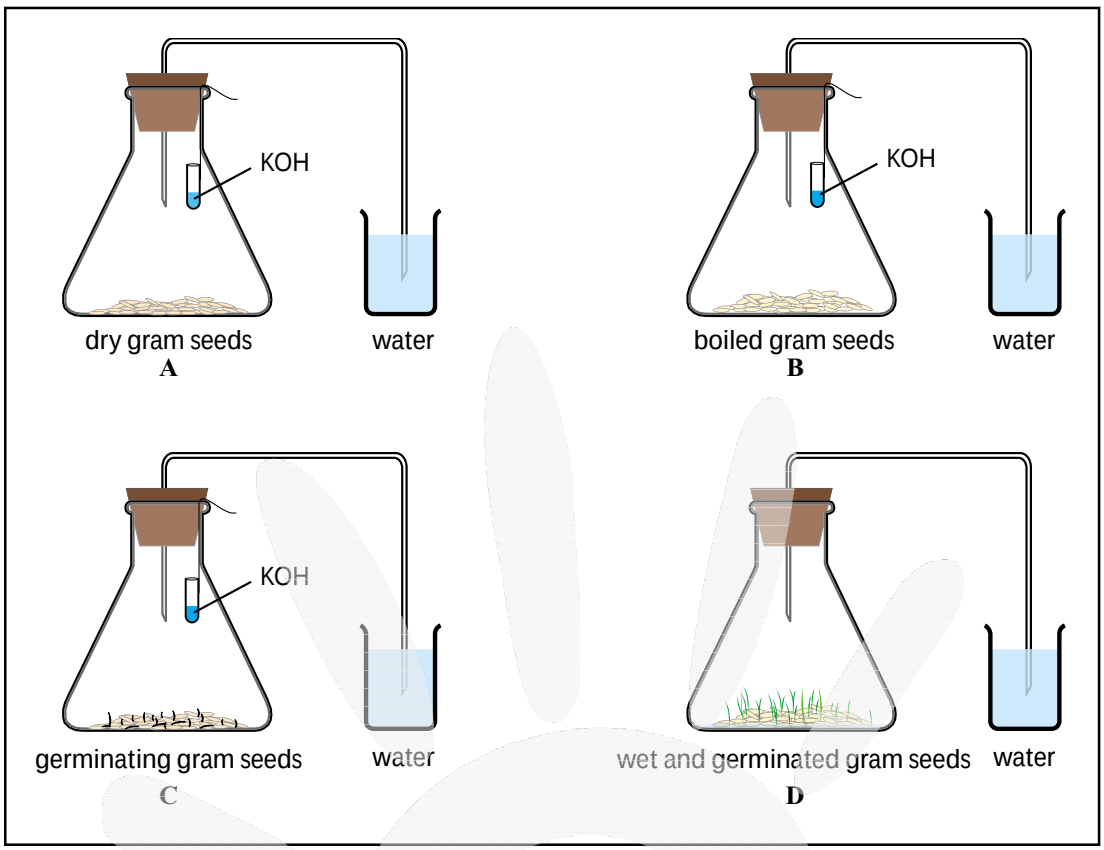
12. In an experiment on photosynthesis, students were instructed to cover a portion of a leaf of a de-starched potted plant with opaque paper as shown in the figure.

"A" covered one of the leaves with red strip, "B" with green, "C" with blue and "D" with black. When the starch test was done on the leaves after 4 hours, the result showed no starch in

(a) the portion covered with red, green and blue strips.
(b) the portion covered with green strip.
(c) the portion covered with black and blue strips.
(d) any of the covered portions.



13. Given below are four different set ups to show that CO_2 is released during respiration.



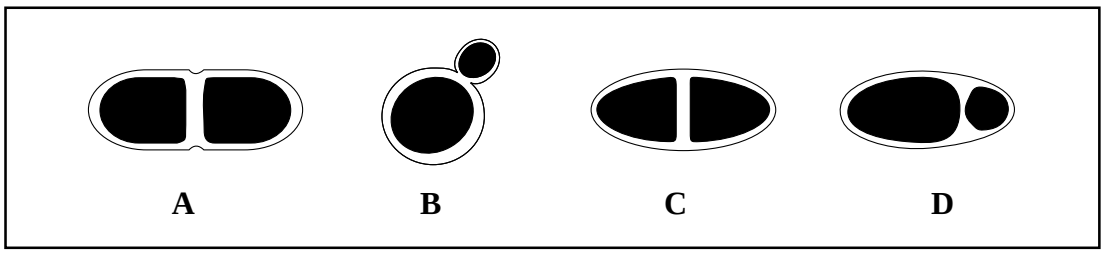
The set up that will give the desired result is

(a) A.
(b) B.
(c) C.
(d) D.

14. Students A, B and C were given five raisins each of equal weight. The raisins were soaked in distilled water at room temperature. A removed the raisins after 20 minutes, B after two hours and C after 40 minutes. If P_A, P_B and P_C denote percentage absorption of water obtained by students A, B and C respectively, then

(a) $P_A > P_B > P_C$.
(b) $P_A < P_B < P_C$.
(c) $P_A < P_B > P_C$.
(d) $P_A = P_B = P_C$.

15. The budding in yeast is illustrated by the diagram



(a) A.
(b) B.
(c) C.
(d) D.

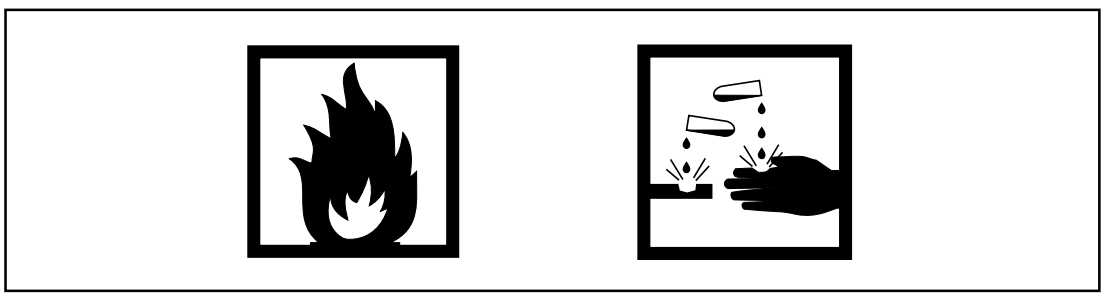
16. A student dissolved 1 g of sugar in 10 mL of distilled water in a beaker A. He dissolved 10 g of sugar in 100 mL of distilled water in beaker B. Then he dropped a few raisins, in each. After two hours he found the raisins

(a) swollen in A and shrunken in B.
(b) shrunken in A and swollen in B.
(c) swollen in both.
(d) shrunken in both.

17. 10 mL of freshly prepared iron sulphate was taken in each of four test tubes. Strips of copper, iron, zinc and aluminium were introduced, each metal in a different test tube. A black residue was obtained in two of them. The right pair of metals forming the precipitates is

(a) copper and zinc.
(b) aluminium and copper.
(c) iron and aluminium.
(d) zinc and aluminium.

18. The following symbols are usually shown on the bottles of commercial acetic acid.



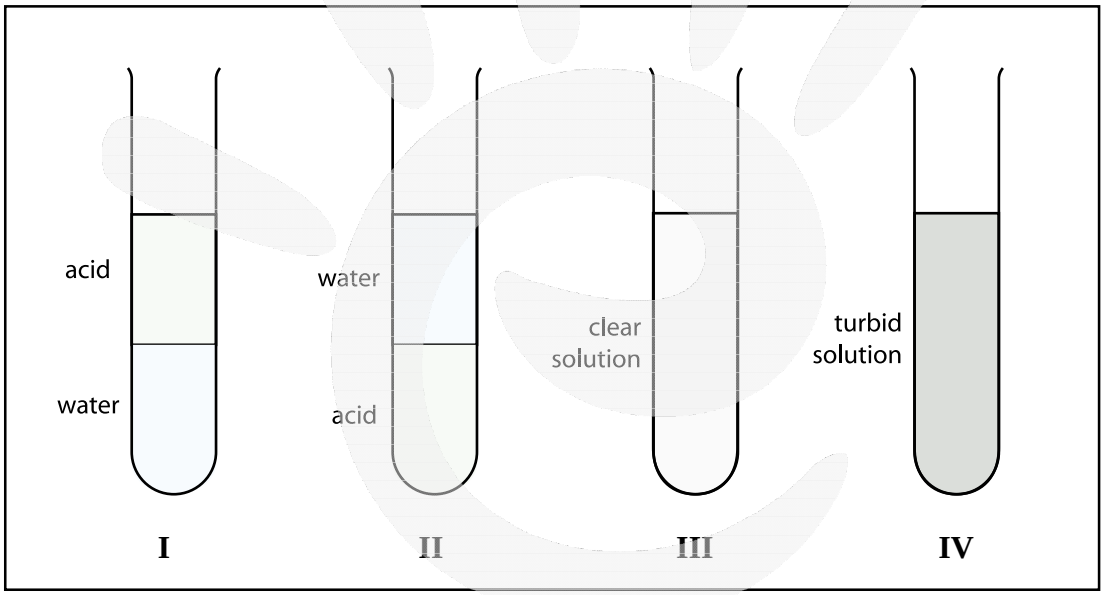
The symbols indicate that acetic acid is

(a) corrosive and flammable.
(b) radioactive and flammable.
(c) oxidizing and corrosive.
(d) flammable and explosive.

19. A strip of copper was placed in a beaker containing zinc sulphate solution. On observing the strip the next day, it was noticed that

(a) the copper strip remained as it was.
(b) the copper strip became thinner.
(c) the copper strip became thicker.
(d) the colour of the strip changed.

20. Amount of 5 mL each of acetic acid and water are mixed together and shaken well.

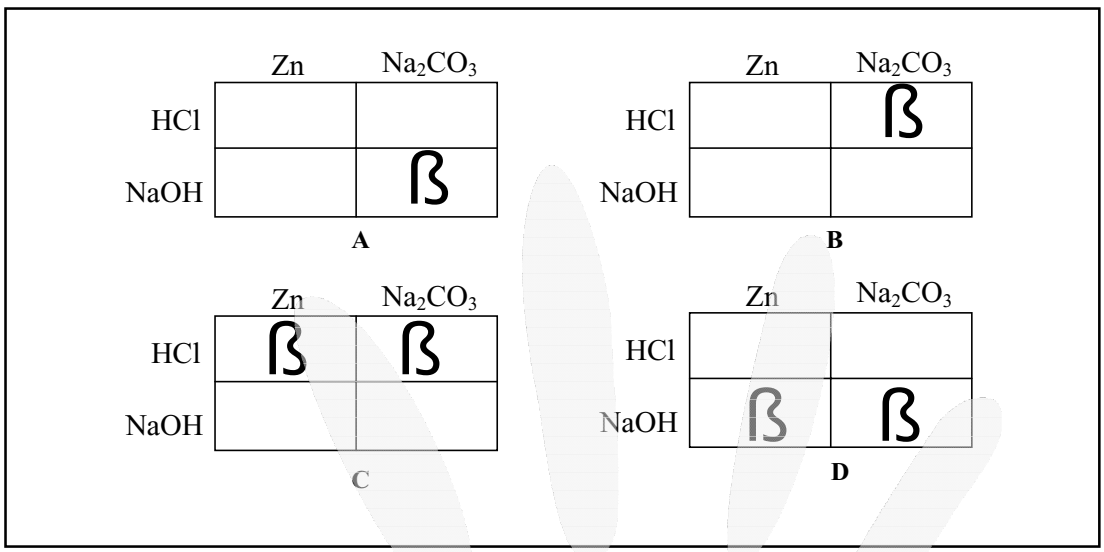


The resulting mixture would appear as in

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

SECTION - B

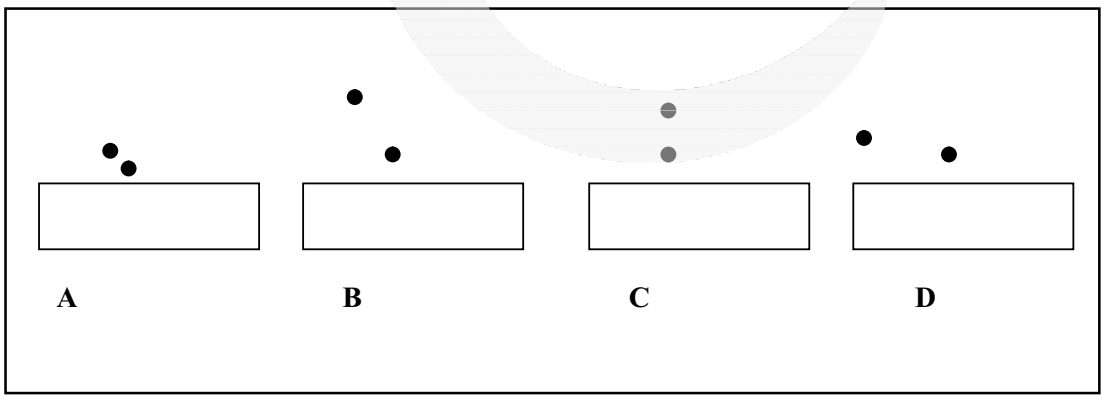
21. Four students studied reactions of zinc and sodium carbonate with dilute hydrochloric acid and dilute sodium hydroxide solutions and presented their results as follows. The ✓ represents evolution of gas, whereas × represents absence of any reaction.



The right set of observations is that of student

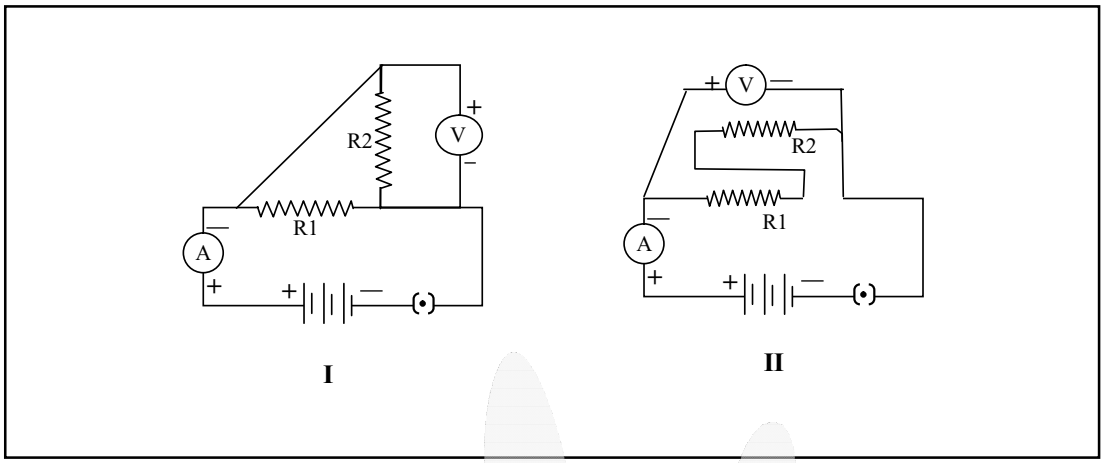
(a) A.
(b) B.
(c) C.
(d) D.

22. Out of the four set ups shown for carrying out the experiment to trace the path of a ray of light through a rectangular glass slab, the best set up is



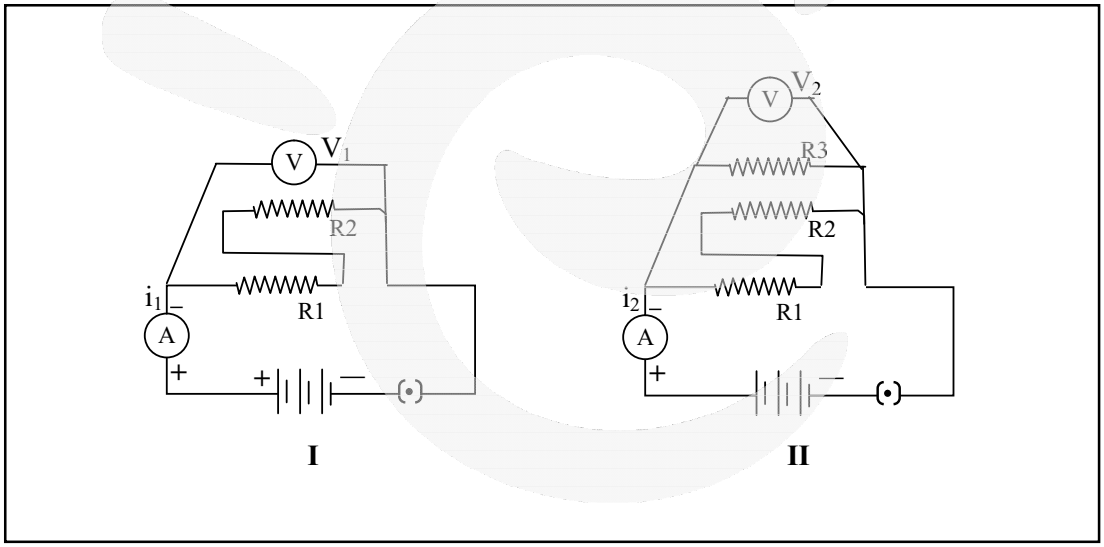
(a) A.
(b) B.
(c) C.
(d) D.

23. The resistors R1 and R2 are connected in



(a) parallel in both circuits.
(b) series in both circuits.
(c) parallel in circuit I and in series in circuit II.
(d) series in circuit I and in parallel in circuit II.

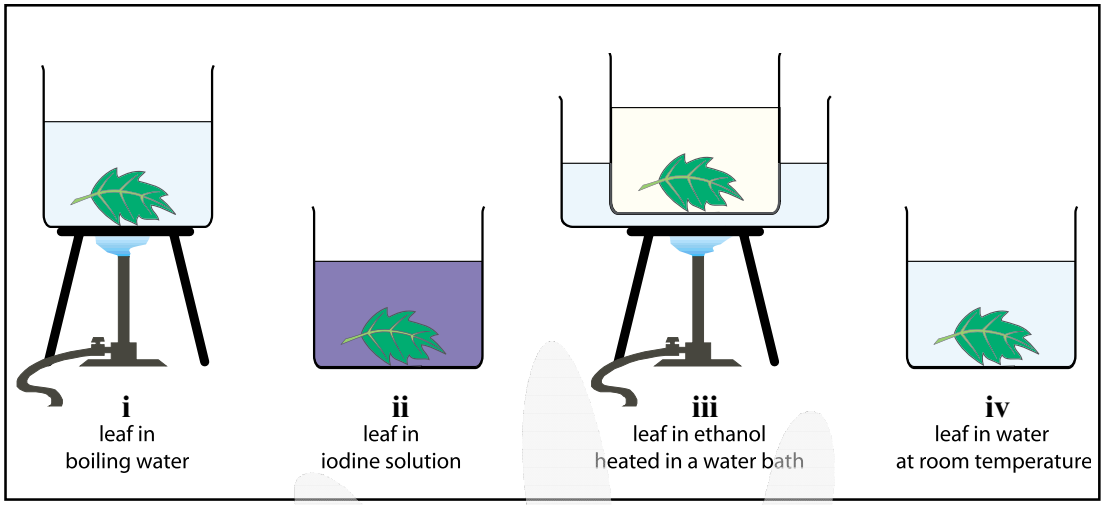
24. Circuit I: ammeter reads current i_1 and voltmeter reads V_1
Circuit II: ammeter reads current i_2 and voltmeter reads V_2



The relationship between the readings is

(a) $i_1 > i_2$; $V_1 = V_2$.
(b) $i_1 < i_2$; $V_1 = V_2$.
(c) $i_1 > i_2$; $V_1 > V_2$.
(d) $i_1 < i_2$; $V_1 < V_2$.

25. A student performed the starch test on a leaf. Some steps involved are shown below.



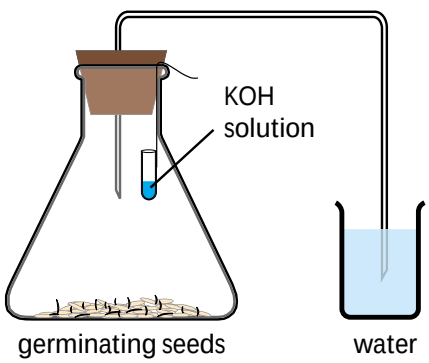
The correct sequence of steps should be

(a) iv; iii; ii; i.
(b) i; ii; iii; iv.
(c) ii; iii; iv; i.
(d) i; iii; iv; ii .

26. A part of de-starched leaf of a potted plant was covered with black paper strips on both sides and the plant was kept in sunlight for 8 hours. The leaf was then tested with iodine after boiling it in alcohol. Only the uncovered part of the leaf turned blue black. The inference is that

(a) CO_2 is necessary for photosynthesis.
(b) light is necessary for photosynthesis.
(c) chlorophyll is necessary for photosynthesis.
(d) water is necessary for photosynthesis.

27. In the experiment shown in the figure, water is found to rise in the bent tube.



The reason is that

(a) seeds use up oxygen in the flask.
(b) carbon dioxide is given out by the germinating seeds.
(c) germinating seeds attract water from the beaker.
(d) seeds use oxygen and release carbon dioxide which is absorbed by potassium hydroxide.

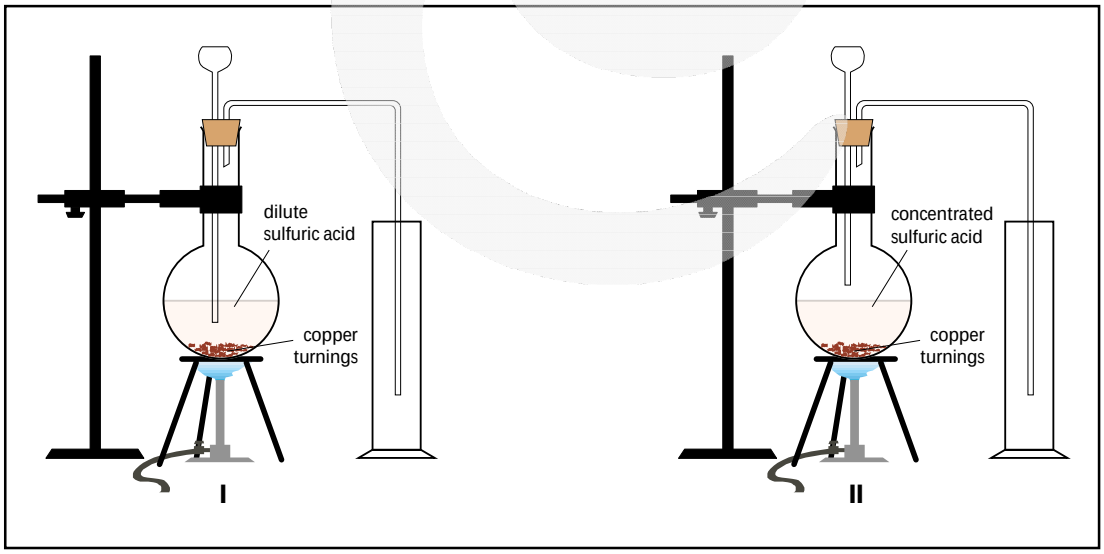
28. A student is given a permanent slide showing binary fission in Amoeba. The following are the steps in focussing the object under the microscope.

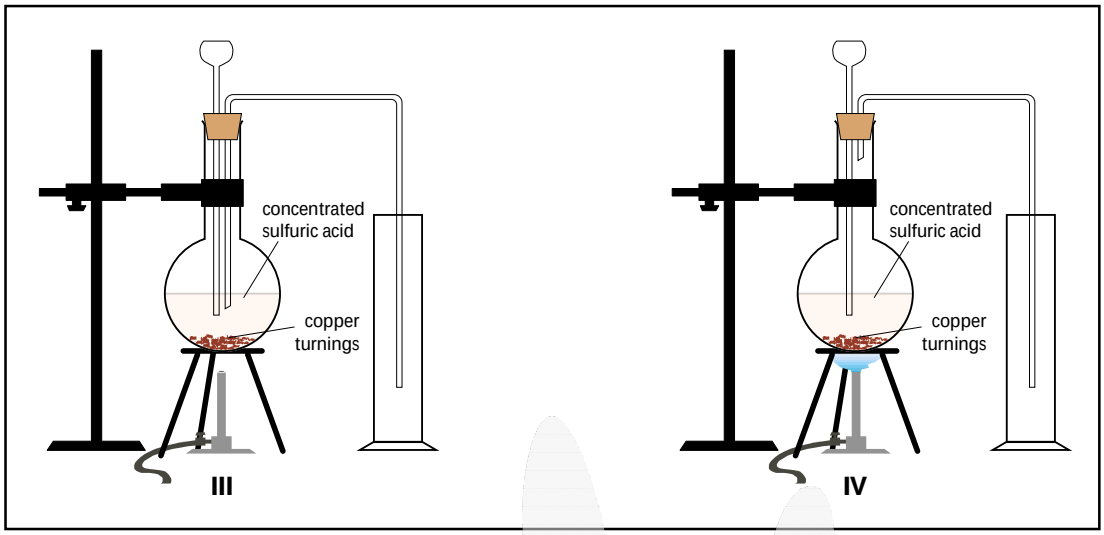
(i) Place the slide on the stage; look through the eye piece and adjust the mirror and diaphragm to get even illumination.
(ii) Look through the eye piece and raise the objective using coarse adjustment until the object is focused.
(iii) Make the focus sharp with the help of fine adjustment.
(iv) Look through the eye piece and move the slide until the object is visible.

The proper sequence of steps is

(a) (i), (iii), (iv), (ii).
(b) (ii), (iii), (iv), (i).
(c) (iv), (iii), (ii), (i).
(d) (i), (iv), (ii), (iii).

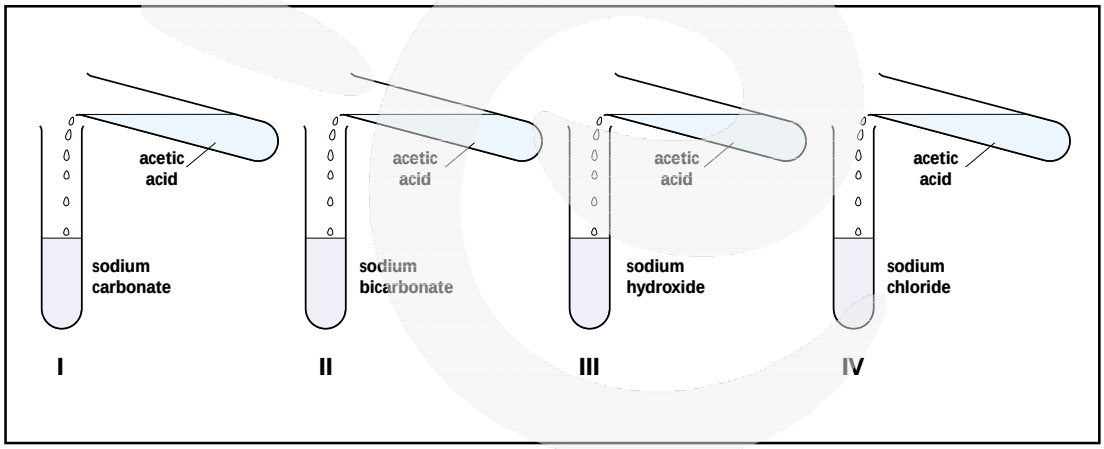
29. For preparing sulphur dioxide in the laboratory the correct set up is shown in figure





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

30. A student added acetic acid to test tubes I, II, III and IV and then introduced a burning candle near the mouth of each test tube.



The candle would not be extinguished near the mouths of test tubes

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

Question-wise Analysis and Scoring Key for Sample Paper I

Q.No	Correct choice	Explanation/ Remarks
1.	(a)	Red colour is at the top and blue colour is at the bottom.
2.	(a)	The colour of pH paper is green in neutral medium, whereas it is red in acidic medium.
3.	(b)	The surface becomes black and dull as the reaction proceeds.
4.	(a)	For the correct measurement of focal length, must have a sharp image on the screen and the meter scale must be correctly positioned between the (sharp image) screen and the centre of the concave mirror.
5.	(c)	The image gets blurred and enlarged/shortened when the screen is pushed farther/nearer from the focus of the convex lens.
6.	(a)	We need to keep the eye far from the glass slab to have a good and proper alignment of the pins.
7.	(b)	We must not only put the ammeter in series and the voltmeter in parallel (with the resistor) but also ensure that the polarities of both the instruments are correct.
8.	(a)	The plotted points should not only lie (nearly) on a straight line but the straight line must also pass through the origin. Also the current should increase (proportionally) with the applied potential difference.
9.	(d)	Circuit (I), with no dot put in between the plug key symbol, is an open circuit. Circuit (II), with the dot put there, is a closed circuit in which a current of 5/5 A i.e. 1 A would flow.
10.	(c)	We would have a current flowing in the ammeter but no deflection in the voltmeter only if the voltmeter connections are loose.
11.	(b)	Guard cells have nucleus as well as chloroplasts.
12.	(d)	Covered portion of the leaf does not get sunlight irrespective of the colour of the strip.
13.	(c)	In (a) seeds are dormant, in (b) killed by cooking and in (d) there is no KOH.
14.	(c)	Absorption of water increases with time up to its maximum limit.
15.	(b)	The bud in yeast appears as a protuberance.
16.	(c)	Solutions in both A and B are hypotonic to raisins and hence they swell.
17.	(d)	Zinc and aluminium being more reactive will replace iron from iron sulphate.
18.	(a)	Acetic acid is corrosive and flammable.
19.	(a)	Copper is less reactive than zinc and, therefore, no reaction occurs.
20.	(c)	Acetic acid is miscible with water forming a clear solution.
21.	(a)	Zinc reacts with dilute HCl and NaOH, whereas Na_2CO_3 reacts only with dilute HCl.

22.	(b)	We must not only ensure that the two pins (on the incident ray) are relatively far apart but also keep the angle of incidence preferably between 30^0 and 60^0.
23.	(c)	We must not look for a stereotyped circuit diagram but look for the basic condition for (i) parallel (ii) series connection of two resistors in a given circuit.
24.	(b)	The equivalent resistance, of a parallel combination of resistors, is less than the resistance of either of its two branches. The equivalent resistance, in circuit 2, is, therefore, less than (R_1+R_2) (the equivalent resistance of circuit 1) and hence the current flowing through it increases. The voltage reading, in both cases, is, however, the same.
25.	(d)	Boiling kills the cells, chlorophyll leaches out when boiled in ethanol, but the leaf becomes brittle, made normal by washing it in water. Starch gets stained with iodine.
26.	(b)	Black paper covering prevents light.
27.	(d)	Seeds release CO_2 during respiration, which is absorbed by KOH creating a partial vacuum in the flask. To fill that water rises.
28.	(d)	Proper sequence is to be followed to handle the microscope and to focus the specimen.
29.	(d)	Copper reacts with concentrated H_2SO_4 on heating to give SO_2. The tip of the thistle funnel should dip into conc. H_2SO_4 .
30.	(a)	Acetic acid reacts with Na_2CO_3 and $NaHCO_3$ to liberate CO_2