

CLASS : X

SUBJECT : SCIENCE (SET-I)

Time : 3 Hrs.

MM: 90

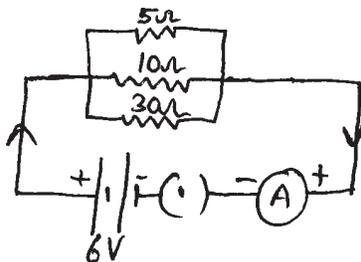
General Instructions :

- (i) The question paper comprises of two Sections, A and B. You are to attempt both the sections.**
- (ii) All questions are compulsory.**
- (iii) All questions of Section-A and all questions of Section-B are to be attempted separately.**
- (iv) Question numbers 1 to 3 in Section-A are one mark questions. These are to be answered in one word or in one sentence.**
- (v) Question numbers 4 to 7 in Section-A are two marks questions. These are to be answered in about 30 words each.**
- (vi) Question numbers 8 to 19 in Section-A are three marks questions. These are to be answered in about 50 words each.**
- (vii) Question numbers 20 to 24 in Section-A are five marks questions. These are to be answered in about 70 words each.**
- (viii) Question numbers 25 to 42 in Section-B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.**

SECTION-A

- Q1. Out of 60W and 40W lamps, which has a higher electrical resistance and why?
(1)
- Q2. Mention the receptors for taste and smell in animals. (1)
- Q3. A farmer found that the pH of soil in his fields is 4.2. Name any two chemical materials which he can mix with the soil to adjust its pH. (1)
- Q4. What are the advantages and disadvantages of using a solar cooker? (two each). (2)
- Q5. (a) Draw a diagram to show the magnetic field lines around a bar magnet.
(b) List any two properties of magnetic field lines. (2)
- Q6. What happens when silver chloride is exposed to sunlight? Write a chemical equation for this reaction. State the use of this reaction. (2)
- Q7. Sodium chloride is a bad conductor of electricity in solid state but conducts electricity in molten state. Justify. (2)

- Q8. (a) For the circuit diagram shown below, calculate - (3)



- (i) the value of current through 30Ω resistor.
 (ii) the total resistance of the circuit.
- (b) Give two advantages of connecting electrical devices in parallel with a battery.
- Q9. The values of current I flowing in a given resistor for the corresponding values of potential difference V across the resistor are given below : (3)

I (A)	0.5	1.0	2.0	3.0	4.0
V (V)	1.6	3.4	6.7	10.2	13.2

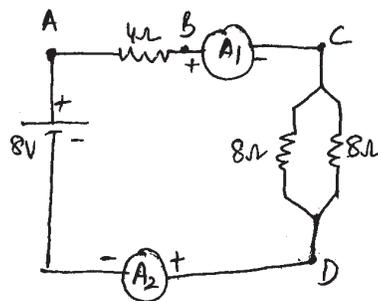
Plot a graph between V and I and calculate the resistance of that resistor.

- Q10. Under what condition does a current carrying conductor kept in a magnetic field experience maximum force? On what other factors does the magnitude of this force depend? Name and state the rule used for determination of direction of force. (3)
- Q11. How will the magnetic field produced in a current carrying circular coil change if we (3)
- increase the value of current?
 - increase the distance from the coil?
 - increase the number of turns of the coil?
- Q12. What is biomass? Explain the working of a biogas plant using a labelled schematic diagram. (3)
- Q13. (a) Translate the following statement into chemical equation and then balance it : (3)
- Solution of aluminium sulphate reacts with solution of sodium hydroxide to form an insoluble substance aluminium hydroxide and soluble sodium sulphate.
- (b) Define the term rancidity.

- Q14. A colourless lead salt, when heated produces a yellow residue and brown fumes
- Name the lead salt
 - Name the brown fumes
 - Write a chemical equation of the reaction involved
 - Name the yellow residue formed. (3)
- Q15. Give reasons : (3)
- An artery divides into smaller and smaller vessels on entering a tissue.
 - Plants have low energy needs.
 - During vigorous exercise lactic acid accumulates in the muscles.
- Q16. State the function of the following hormones : (3)
- Gibberellins
 - Insulin
 - Adrenaline
- Q17. What are the various parts of hindbrain? Mention the function performed by each part. (3)
- Q18. A chemical compound 'Y' is used for making toys and setting of fractured bones.
- Identify 'Y' and give its chemical formula.
 - Write a chemical equation for its preparation.
 - What happens when this compound is mixed with water? (3)
- Q19. Rahul and Atul went to the market to buy nut bolts. Rahul wanted to buy iron nut bolts as they were cheap whereas Atul insisted on buying the expensive nut bolts as they were galvanised. (3)
- Who do you think is wiser? Why?
 - What value is associated with this incident?
 - What is galvanisation?

Q20. Find out the following in the electric circuit given alongside :

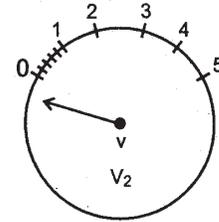
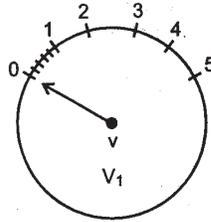
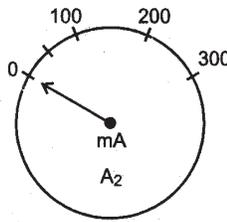
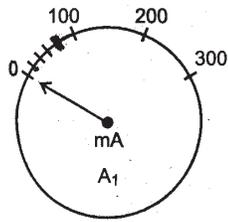
- effective resistance of two 8Ω resistors in the combination.
- current flowing through 4Ω resistor.
- potential difference across 4Ω resistor.
- power dissipated in 4Ω resistor.
- difference in ammeter readings, if any. Give reason. (5)



- Q21. (a) A coil of copper wire is connected to a galvanometer. What would happen if a bar magnet is (5)
- (i) pushed into the coil?
 - (ii) held stationary inside the coil?
 - (iii) pulled out from the coil?
- (b) Name the material used for making a fuse. What is the function of an electric fuse?
- Q22. (a) A metal 'E' is stored under kerosene. When a small piece of this metal is left open in the air it starts warming up and the product formed is dissolved in water which turns red litmus blue. (5)
- (i) Name the metal E.
 - (ii) Write the chemical equation for the reaction when it is exposed to air.
 - (iii) Name the process by which the metal is obtained from its molten chloride.
- (b) How is mercury extracted from cinnabar ore? Write the reactions involved.
- Q23. (a) Complete the following chemical reactions : (5)
- (i) $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow \text{_____} + \text{_____} + \text{_____}$
 - (ii) $\text{NaCl} + \text{H}_2\text{O} + \text{NH}_3 + \text{CO}_2 \rightarrow \text{_____} + \text{_____}$
- (b) Why do aqueous solutions of HCl, H_2SO_4 etc. show acidic character while solutions of compounds like alcohol and glucose do not show acidic character?
- (c) What effect does the concentration of H^+ (aq) ions have on the nature of the solution?
- Q24. (a) Draw a neat diagram of human alimentary canal and label the following parts : (5)
- oesophagus, liver, gall bladder, anus
- (b) Name the digestive juice secreted by liver and give its role in the process of digestion.

SECTION-B

- Q25. Two pairs of ammeters and voltmeters are given in the figure. Which pair should a student select for the verification of Ohm's law?



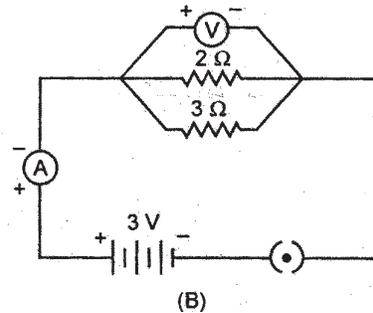
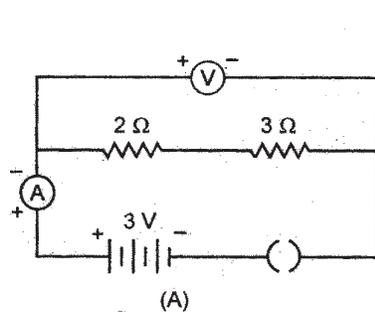
(a) A_1, V_1

(b) A_1, V_2

(c) A_2, V_1

(d) A_2, V_2

Q26. For the circuits A and B shown below, the voltmeter readings would be



(a) 0.6V in circuit A and 2.5V in circuit B

(b) 0V in both circuits

(c) 3V in both circuits

(d) 0V in circuit A and 3V in circuit B

Q27. In an electric circuit, three resistors R_1, R_2 and R_3 are connected in series such that $R_2 = R_3$. If V_1, V_2 and V_3 are the voltages across R_1, R_2 and R_3 respectively, then

(a) $V_1 = V_2$

(b) $V_2 = V_3$

(c) $V_1 = V_3$

(d) $V_1 = V_2 = V_3$

Q28. The current flowing through a resistor connected in an electrical circuit and the potential difference developed across its ends are shown in the given figures :-

The value of resistance of the resistor in ohm is



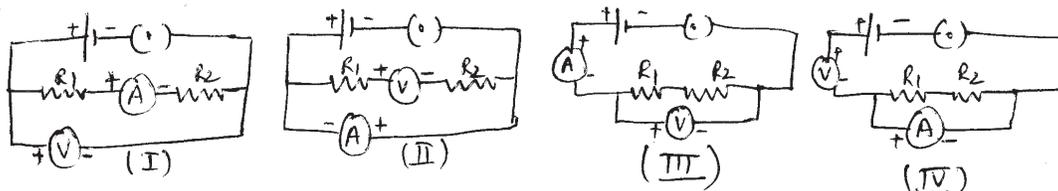
(a) 25

(b) 20

(c) 10

(d) 15

Q29. Two students set up their circuits for finding the equivalent resistance of two resistors connected in series in different ways as shown.



Which of the circuit diagrams show the correct way of connecting the voltmeter?

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

Q30. The colour of precipitate formed when aqueous solution of sodium sulphate is added to the aqueous solution of barium chloride is :

- (a) yellow
 (b) white
 (c) green
 (d) orange

Q31. Four solutions I, II, III and IV were given to a student to test their acidic or basic nature by using a pH paper. He observed that the colour of pH paper turned to red, blue, green and orange respectively when dipped in the four solutions. The correct conclusion made by the student would be that :

- (a) I, II and III are acidic
 (b) I and IV are acidic
 (c) II, III and IV are basic
 (d) II and IV are basic

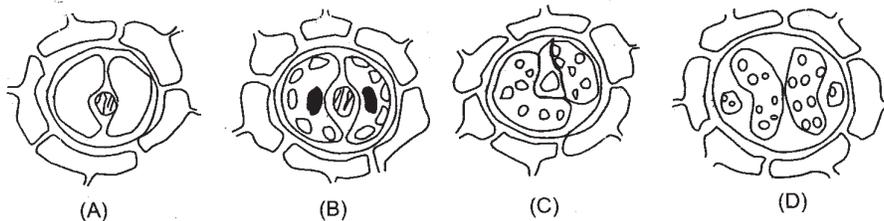
Q32. Which one of the following is not observed when water and quick lime are mixed?

- (a) A vigorous reaction takes place
 (b) Outer surface of the beaker becomes hot
 (c) Outer surface of the beaker becomes cold
 (d) Water vapours come out of the beaker

Q33. The reddish brown substance observed as a product while heating crystals of pale green compound of iron is

- (a) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
 (b) FeSO_4
 (c) Fe_2O_3
 (d) Fe_3O_4

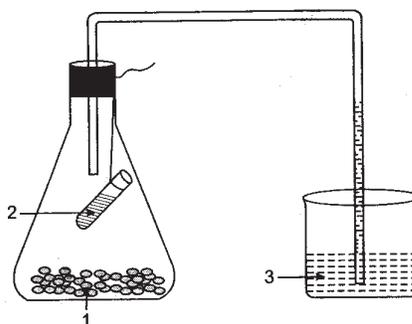
Q40. Students observed the epidermal peel of a leaf under the high power of a microscope. The following are the sketches made by them.



The correct sketch is

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

Q41. Label the marked parts in the given figure :



Which labelling is correct?

	1	2	3
(a)	Germinating seeds	Dry solid KOH	Water
(b)	Seeds	Dry KOH	Water
(c)	Boiled seeds	Empty test tube	Lime Water
(d)	Soaked seeds	KOH solution	Water

Q42. Which precaution should not 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 completely dip into water.
(c) The germinating seeds should be kept moist and should not be let dry.
(d) Germinating seeds should be boiled before the experiment.

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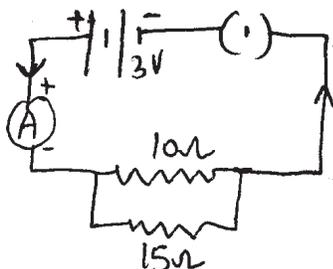
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SECTION-A

- Q1. Out of the two, a toaster of 1 KW and an electric heater of 2KW, which has a greater resistance and Why? (1)
- Q2. Name the hormones produced by the gonads at puberty in boys and girls. (1)
- Q3. Two solutions A and B have pH value of 3.0 and 9.5 respectively. Which of these will turn phenolphthalein from colourless to pink? Why? (1)
- Q4. What are the qualities of an ideal source of energy? (any four) (2)
- Q5. (a) Draw a diagram to show the magnetic field lines around a current carrying circular loop.
(b) What is the direction of magnetic field lines outside the magnet? (2)
- Q6. What happens when copper oxide is heated in the atmosphere of hydrogen? Write a chemical equation for this reaction. (2)
- Q7. Why is hydrogen gas not evolved when metals react with dilute nitric acid? (2)

Q8. Study the following circuit and answer the questions that follow :



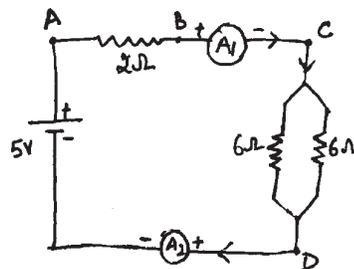
- (a) State the type of combination of two resistors in the circuit.
- (b) How much current is flowing through (i) 10Ω resistor (ii) 15Ω resistor? (3)
- Q9. In an experiment to study the relationship between the potential difference across resistor and the current flowing through it, a student records the following observations:

Potential difference (V)	2	3	4.5	5	6
Current (A)	0.08	0.12	0.15	0.20	0.24

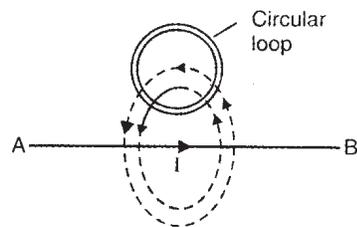
Find in which one of the above set of readings the trend is different from others and must be rejected. Calculate the mean value of resistance of the resistor based on the remaining set of readings. (3)

- Q10. What is a solenoid? With the help of a suitable diagram show the pattern of magnetic field lines around a current carrying solenoid. State the region where field is uniform. (3)
- Q11. State the rule to determine the direction of force experienced by a current carrying conductor in a magnetic field. How will this force get affected on :-
- (a) doubling the magnitude of current?
- (b) reversing the direction of current flow? (3)
- Q12. What is geothermal energy? Briefly describe the principle of harnessing this energy. What is its advantage? (any 2). (3)
- Q13. (a) Translate the following statement into chemical equation and then balance it :
- Magnesium carbonate salt is treated with dilute hydrochloric acid to form soluble magnesium chloride, water along with evolution of carbondioxide gas.
- (b) What is meant by the term corrosion? (3)

- Q14. When we mix the solution of lead nitrate and potassium iodide,
- What is the colour of the precipitate formed?
 - Name the precipitate formed.
 - Write the balanced chemical equation for it.
 - State the type of chemical reaction. (3)
- Q15. Give reasons :-
- Veins possess valves.
 - Nasal cavity is lined by hair and mucus.
 - Birds and mammals show double circulation. (3)
- Q16. Mention the function of following hormones : (3)
- Auxins
 - Thyroxine
 - Cytokinin
- Q17. Name the functional unit of nervous system and explain its structure. (3)
- Q18. A chemical compound 'X' is used in soda-acid fire extinguishers and also as an ingredient in antacids.
- Identify 'X' and give its chemical formula.
 - Write a chemical equation for its preparation.
 - What happens when this compound is strongly heated? (3)
- Q19. Gold is a very precious metal. Pure gold is very soft, it is therefore not suitable for making jewellery. It is alloyed with either silver or copper to make it hard. But sometimes jewellers mix a large quantity of copper and silver in gold to earn more profit.
- What precaution should we take while purchasing gold jewellery?
 - Why does the government insist on purchasing Hallmark jewellery?
 - What value is associated with it? (3)
- Q20. Find out the following in the electric circuit given below :
- effective resistance of two 6Ω resistors in the combination.
 - current flowing through 2Ω resistor.
 - potential difference across 2Ω resistor.
 - power dissipated in 2Ω resistor.
 - difference in ammeter readings, if any. Give reasons. (5)



Q21. (a) A current flows in a horizontal straight wire. A circular loop is kept vertically above it.



- (i) Will an induced current flow in the circular loop? Give reason.
- (ii) Will an induced current flow in the circular loop, when the current in horizontal straight wire is increased? Give reasons to support your answer.

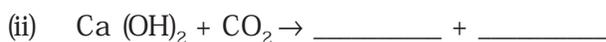
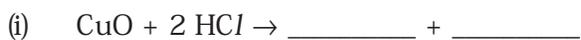
(b) Draw a well labelled diagram of a domestic electric circuit. (5)

Q22. (a) How is iron extracted from iron oxide? What is this process termed as? Write one application of this process.

(b) Nikita was given Mg Zn, Fe and Cu metals. She put each of them in dilute HCl contained in different test tubes. Identify which of them -

- (i) will not displace H_2 from dil. HCl.
- (ii) forms a pale green substance.
- (iii) will react with hot water to release H_2 gas.
- (iv) will be displaced from its salt solution by all other metals. (5)

Q23. (a) Complete the following chemical reactions -



(b) While diluting an acid, why is it recommended that the acid should be added to water and not water to acid?

(c) When blue copper sulphate crystals are heated strongly, what change is observed and why? (5)

Q24. (a) Draw a neat diagram of human heart and label the following parts - pulmonary artery, left atrium, septum, aorta.

(b) State two vital functions of the human kidney. Name the procedure used in the working of artificial kidney. (5)

SECTION-B

Q25. The current flowing through a conductor and the potential difference across its two ends are as per readings of the ammeter and the voltmeter shown in the figure. The resistance of the conductor would be -

- (a) $A < B < C < D$ (b) $A < D < C < B$
 (c) $C < B < A < D$ (d) $B < C < A < D$

Q32. While performing an experiment in the laboratory. Shalu inhaled some gases evolved during the reaction which made her feel suffocated. Which reaction was she performing?

- (a) reaction of zinc with dilute hydrochloric acid
 (b) reaction of calcium oxide and water
 (c) heating crystals of ferrous sulphate
 (d) heating calcium carbonate powder.

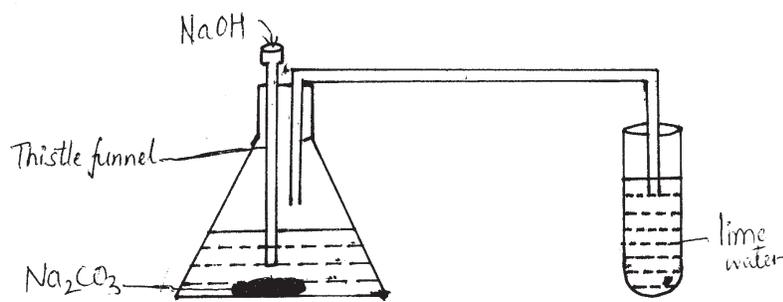
Q33. The dirty white substance observed as an intermediate product while heating crystals of pale green compound is -

- (a) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (b) FeSO_4
 (c) Fe_2O_3 (d) Fe_3O_4

Q34. Four students performed the reaction of dilute hydrochloric acid and a solution of sodium hydroxide with zinc metal and solid sodium carbonate separately. They reported the possible reaction by (✓) and no reaction by (x). In which of the following set all observations are correct?

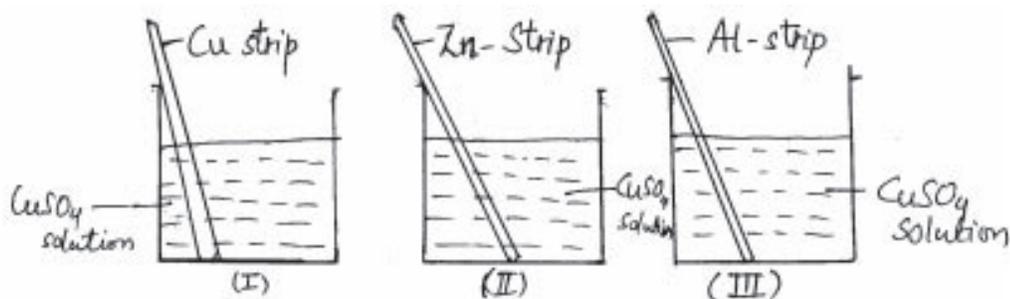
Set	$\text{HCl} + \text{Zn}$	$\text{HCl} + \text{Na}_2\text{CO}_3$	$\text{NaOH} + \text{Zn}$	$\text{NaOH} + \text{Na}_2\text{CO}_3$
(a)	✓	✓	✓	✓
(b)	x	x	✓	✓
(c)	✓	✓	x	x
(d)	✓	✓	✓	x

Q35. The gas evolved in the experiment shown will be -



- (a) CO (b) CO_2
 (c) H_2 (d) No gas is evolved

Q36. Strips of Cu, Zn and Al were dipped in solutions of copper sulphate in three different beakers as shown in the figure below -



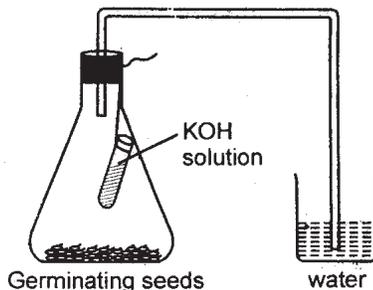
A brown coating was observed on the strip in -

- (a) Beaker I only
- (b) Beaker I and II
- (c) Beaker II only
- (d) Beaker II and III

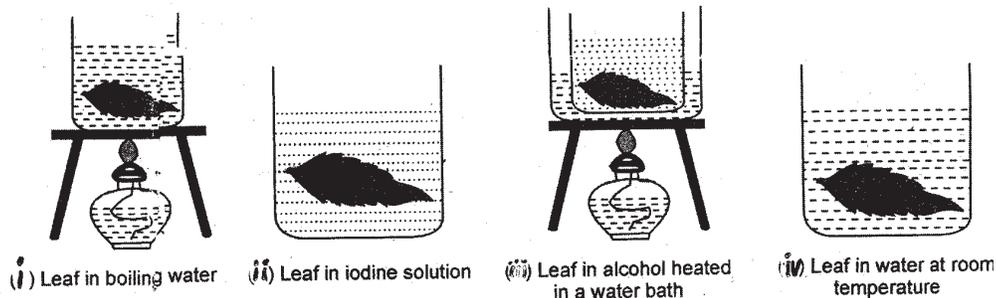
Q37. In the experiment shown in the figure, water is found to rise in the bent tube.

The reason is that -

- (a) seeds use up oxygen in the flask.
- (b) carbon dioxide is given out by germinating seeds.
- (c) germinating seeds attract water from the beaker.
- (d) seeds use oxygen and release CO_2 which is absorbed by potassium hydroxide due to which a partial vacuum is created.



Q38. A student performed 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)

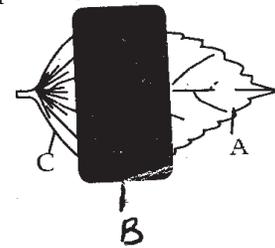
Q39. A student focussed the leaf epidermal peel under the low power of microscope but could not see all the parts. He should -

- (a) use the coarse adjustment knob again to focus the slide
- (b) use the fine adjustment knob to increase magnification
- (c) focus under high power using coarse adjustment knob.
- (d) focus under high power using the fine adjustment knob.

Q40. In the experiment "Light is essential for photosynthesis" to test the presence of starch in the experimental leaf, the leaf is boiled in alcohol for a few minutes in a water bath. The use of water bath is recommended because -

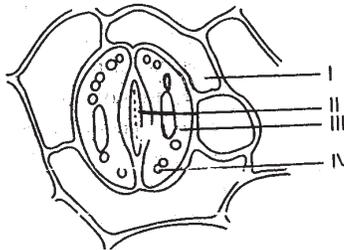
- (a) steam from the water bath heats the leaf rapidly
- (b) steam from the water bath dissolves the chlorophyll
- (c) the boiling point of water is less than that of alcohol
- (d) alcohol is flammable.

Q41. A leaf from a destarched plant is covered with black strip as shown in figure. When starch test was done after 8 hours of exposure to sunlight, which part(s) will turn blue-black?



- (a) A and B
- (b) B and C
- (c) C and A
- (d) the whole leaf

Q42. Label the marked parts in the given figure -



Which labelling is correct?

	I	II	III	IV
A	Stoma	Nucleus	Epidermal cell	Cell wall
B	Nucleus	Stoma	Epidermal cell	Guard cell
C	Epidermal cell	Stoma	Nucleus	Chloroplast
D	Cell wall	Epidermal cell	Nucleus	Stoma

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

(D-9)