SECOND TERMINAL EXAMINATION (DEC-2025)

CLASS - X

SUBJECT - SCIENCE

Time : 3 Hrs. **Max. Marks : 80**

General Instructions:

(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(ii) All questions are compulsory.

SECTION - A

Q1. Which of the following groups contains only parasitic organisms?

A. Yeast, mushroom, tapeworm, leech, Cuscuta
B. Tapeworm, leech, tick, lice, Cuscuta
C. Lion, cow, tick, mushroom, grass
D. Cuscuta, cactus, grass, leech, lice 1

Q2. If the Pons part of brain is damaged, which of the following functions would be most immediately affected?

A. Voluntary muscle movement
B. Coordination between cerebrum and cerebellum
C. Regulation of heart rate
D. Hunger and thirst control 1

Q3. A person is found to breathe in deeply and holds the breath for a while, which of the following immediate changes is most likely to occur in the body?

A. Decrease in CO_2 concentration in blood slower breathing
B. Increase in CO_2 concentration stimulation of medulla → urge to exhale
C. Increase in oxygen concentration inhibition of respiratory center
D. Decrease in oxygen concentration → suppression of breathing. 1

Q4. In a cross between two heterozygous rabbits (Bb x Bb) where Bb represent hybrid black, the probability that an offspring will have white fur is .....

A. 1
B. 3/4
C. 1/2
D. 1/4

Q5. Choose the correct statements about the 10% law in energy transfer.

(i) Only 10% of energy is passed to the next trophic level.
(ii) 90% of the energy is lost as heat.
(iii) Energy transfer is unidirectional.
(iv) Energy can be recycled back from consumers to producers.

A. (i), (ii), (iii)
B. (ii), (iii), (iv)
C. (i) and (iv)
D. (i), (ii), (iv).

Q6. Which of the following statements are correct about abscisic acid (ABA)?

(i) It is a stress hormone of plants that inhibits the growth and also seed dormancy.
(ii) It promotes wilting and closure of stomata during water stress.
(iii) It enhances cell elongation.
(iv) It is a growth-promoting hormone.
(v) It is an inhibitory hormone.

A. (i), (ii), (v)
B. (ii), (iii), (v)
C. (i), (iii), (iv)
D. (i), (ii), (iv)

Q7. Pick up the option which correctly describes the impact of Biomagnification?

(i) It refers to the accumulation of non-biodegradable substances through food chains.
(ii) The concentration of harmful chemicals decreases at each trophic level.
(iii) Top-level consumers are most affected.
(iv) It occurs only with biodegradable wastes.
(v) DDT is a common example of a biomagnifying pollutant.

A. (i), (iii), (v)
B. (ii), (iii), (iv)
C. (i), (ii), (v)
D. (i), (iv), (v) 1

The following two questions consist of two statements - Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, and R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

Q8 Assertion (A): The F2 generation in a monohybrid cross shows both dominant and recessive traits.
Reason (R): The recessive trait reappears due to segregation of alleles in F1 gametes. 1

Q9. Assertion (A): In a food web, removal of one species may affect several other species.
Reason (R): Food webs consist of interlinked food chains, showing multiple dependencies. 1

Q10. (i) Plants also need to excrete the waste products. Give one example each of a liquid and a solid waste excreted by plants.

(ii) How is cellular vacuole helpful to the plants in excretion? 2

Q11. Despite knowing that CFCs damage the ozone layer, some countries continued to use them for refrigeration.
(i) Predict one long-term consequence of this action on living organisms.
(ii) Suggest one international effort that helped control this problem. 2

Q12. Why is a 4-chambered heart more efficient than a 3-chambered heart? Give one example each of the organisms having the said type of heart. 2

Q13. (i) If all the waste we produce is biodegradable, will this have no impact on the environment? Comment on the consequences how would this surplus waste affect us?
(ii) Why are pesticides non-biodegradable? 3

Q14. Draw a labelled diagram of a reflex arc and explain how the spinal cord and brain work together during a reflex action. 3

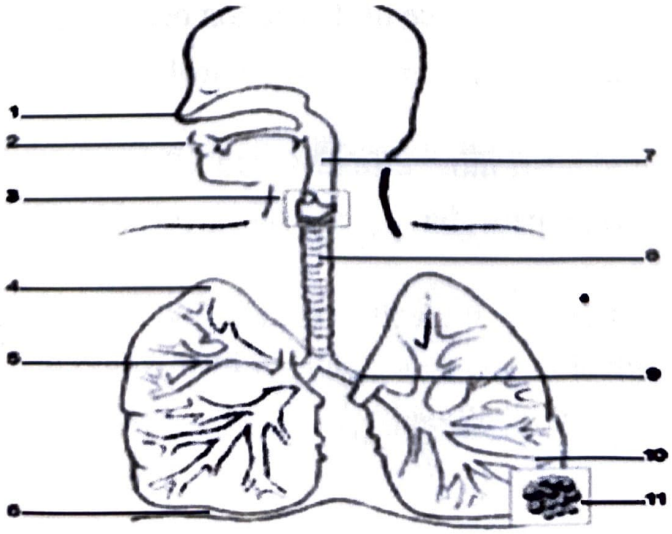
Q15. Arjun participated in a running race. After completing it, he was breathing fast and deeply. Help him understand some steps in the process of respiration in human beings by answering the questions given below.

A. During running, Arjun started breathing fast. Why does this happen? What is the difference between aerobic and anaerobic respiration in humans during such conditions?

B. How is dissolved oxygen in water is taken up by the fish

C. The figure given below represents parts of the human respiratory system.

Number and name the part which acts as a common passage for air and food and also the part through which air enters the lungs. 4



Q16. During observation under the microscope, a student saw:

- In organism X, a bulge formed and grew into a small organism attached to the parent.
- In organism Y, the cell split into two identical daughter cells.

Identify X and Y, name their mode of reproduction, and explain one difference between the two.

(ii) List any two advantages and disadvantages of asexual reproduction in such organisms. 5

SECTION-B

Q17. Identify the correct statement about the following reaction:

$2H_2S + SO_2 \rightarrow 2H_2O + 3S$

A. H_2S is oxidising agent and SO_2 is reducing agent
B. SO_2 is oxidised to S
C. H_2S is reducing agent and SO_2 is oxidising agent
D. H_2S is reduced to S 1

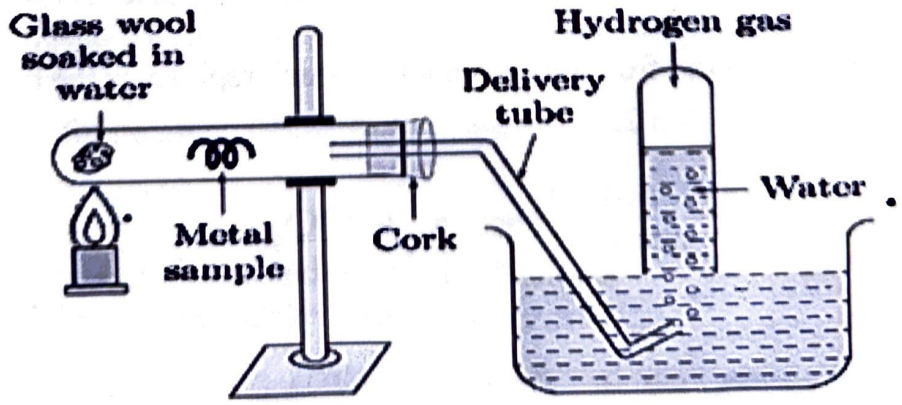
Q18. Four statements about acids and bases are listed below:

(i) Acids furnish H^+ ions in aqueous solution while bases furnish OH^- ions.
(ii) Acids turn phenolphthalein pink and bases make it colourless.
(iii) Acids turn blue litmus red while bases turn red litmus blue.
(iv) Sodium hydroxide solution furnishes H^+ ion in water.

Which statements are correct?

(A) (i) and (ii) (B) (i) and (iii) (C) (ii) and (iv) (D) (iii) and (iv) 1

Q19. Action of steam on a metal is shown in the figure.



The metal sample in the above experiment is:

(A) Lead (B) Zinc (C) Platinum (D) Copper 1

Q20. Which of the following is correctly matched:

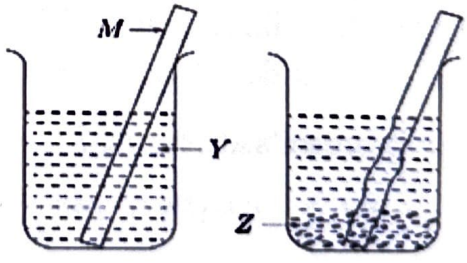
OPTIONS	SALT	pH
(A)	CH_3COONa	less than 7
(B)	K_2SO_4	More than 7
(C)	NH_4Cl	7
(D)	$(NH_4)_3PO_4$	Less than 7

1

Q21. Which of the following substances will not give carbon dioxide on treatment with dilute acid?

(A) Marble (B) Limestone (C) Baking soda (D) Lime. 1

Q22. A metal rod (M) was dipped in a coloured solution (Y). After some time it was observed that the metal rod starts dissolving in the solution and the solution starts fading in colour. However, a coloured precipitate (Z) was seen at the bottom of the beaker. (M), (Y) and (Z) could be:



(A) M = Ag, Y = $CuSO_4$, Z = Cu (B) M = Cu, Y = $ZnSO_4$, Z=Zn
(C) M = Zn, Y = $FeSO_4$, Z = Fe (D) M = Fe, Y = $Al_2(SO_4)_3$, Z =Al 1

Q23. Identify the correct option from the given table which represents the type of reactions occurring in step 1 and step 2. 1

Options	Step-1	Step-2
(A)	Endothermic	Endothermic
(B)	Endothermic	Exothermic
(C)	Exothermic	Exothermic
(D)	Exothermic	Endothermic

Q24. The following question consists of two statements - Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

(A) Both A and R are true, and R is the correct explanation of A.
(B) Both A and R are true, and R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

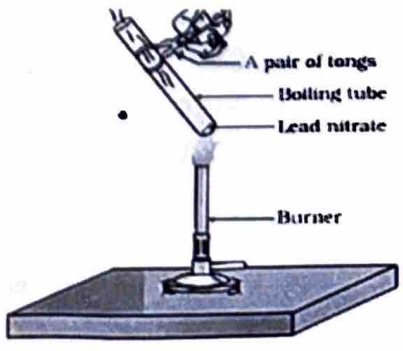
Assertion (A): C_2H_2, C_3H_4, and C_4H_6 belong to the same homologous series.
Reason (R): All these compounds are alkenes containing a double bond and differ successively by a $-CH_2-$ group. 1

Q25. The metals produced by various reduction processes are not very pure they contain impurities which must be removed to obtain pure metal.

(i) Which material will be used as anode and cathode for refining of silver by the process of electrolysis?
(ii) Why is aluminium extracted by electrolytic reduction of its oxide instead of using carbon reduction? 2

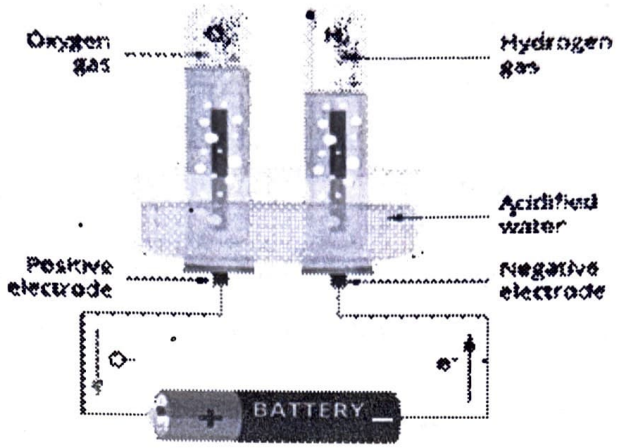
Q26. (a) 'M' is a metal which may be one out of Cu, Fe, Al and Na. One of its ore is rich in M_2O_3 and it corrodes easily .Identify 'M' and write the chemical formulae of its chlorides.
(b) Reactivity of Al decreases when it is dipped in HNO_3. Give reason.
(c) Show the formation of sodium oxide by electron transfer method. 3

Q27.(A) Observe the figure given below and answer the following questions :



(i) Name the type of reaction and write one observation.
(ii) Write the balanced chemical equation for the reaction.

(B) The following activity for the electrolysis is setup in the science lab by the teacher:



Why the volume of water displaced by hydrogen gas is double than that of oxygen. 3

Q28. During a classroom demonstration, the teacher decided to show the practical uses of baking soda and washing soda to help students understand their importance in everyday life. She first mixed baking soda with vinegar and observed brisk effervescence due to evolution of a gas. Then she prepared a mild solution of washing soda and showed how it removes grease from cloth. She also added washing soda to a beaker containing hard water and showed how it forms precipitate with calcium and magnesium salts. She repeated her observation using different amount of each salt and recorded the data below:

S.No.	Salt sample	Quantity (g)	observation
1.	Baking soda	2	Rapid gas evolution with vinegar
2.	Washing Soda	5	Stains removed from clothes
3.	Washing Soda	10	Soap foam increased in hard water

Answer the following questions based on the above information:

(A) Which of the following gas is evolved when baking soda reacts with vinegar?
(a) Hydrogen
(b) Carbon dioxide
(c) Nitrogen
Justify your answer by writing a chemical equation.

(B) A student observed at her home that baking soda is used in making cakes and other bakery items. She wondered how it helps in making them soft and fluffy. Explain the

role of baking soda in baking.

(C) If too much baking soda is added in cooking, the food may taste bitter. Why does this happen?

(D) Which of the following statements is true about washing soda. Give reason in support of your answer.

(a) It is basic and helps to preserve food.
(b) It is acidic and removes grease from clothes.
(c) It is basic and precipitates Ca^{2+} and Mg^{2+} ions as their carbonates.
(d) It is acidic and used as antacid. 4

Q29. One mole of a hydrocarbon 'X' undergoes complete combustion to produce two mole of carbon dioxide and two mole of water.

(a) Identify 'X' and write the balanced chemical equation for its complete combustion.
(b) Draw its electron dot structure and give its IUPAC name.
(c) Write the chemical equation for its formation from alcohol 'Y'. Also mention the reagent and the condition required.
(d) Give the reactions of alcohol 'Y' with the following:
(i) Sodium metal.
(ii) Alkaline potassium permanganate. 5

Section C

Q 30. In the following cases, a ray is incident on a concave mirror. In which case is the angle of incidence equal to zero?

A. ray parallel to the principal axis.
B. A ray passing through the centre of curvature and incident obliquely.
C. A ray passing through the principal Focus and incident obliquely.
D. A ray incident obliquely to the principal axis, at the pole of the mirror.

Q 31. Rohit was revising concepts of electric circuits and noted the following statements:

I. The potential difference between two points is the work done to move a unit charge between them.
II. The resistance of a conductor is directly proportional to its length and inversely proportional to its cross-sectional area.
III. Electric current is defined as the amount of energy flowing per second throgh a conductor.

Choose from the following the correct option that lists the correct statement:

A. I and II

B. I and III

C. II and III

D. I, II and III. 1

Q 32. Select the correct answer to the question from the following

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, but R is not the correct explanation of A.
C. A is true, but R is false.
D. A is false, but R is true.

Assertion (A): If two thin lenses of power +2.0 D and -1.0 D are placed in contact, the equivalent power of the combination will be +1.0 D.

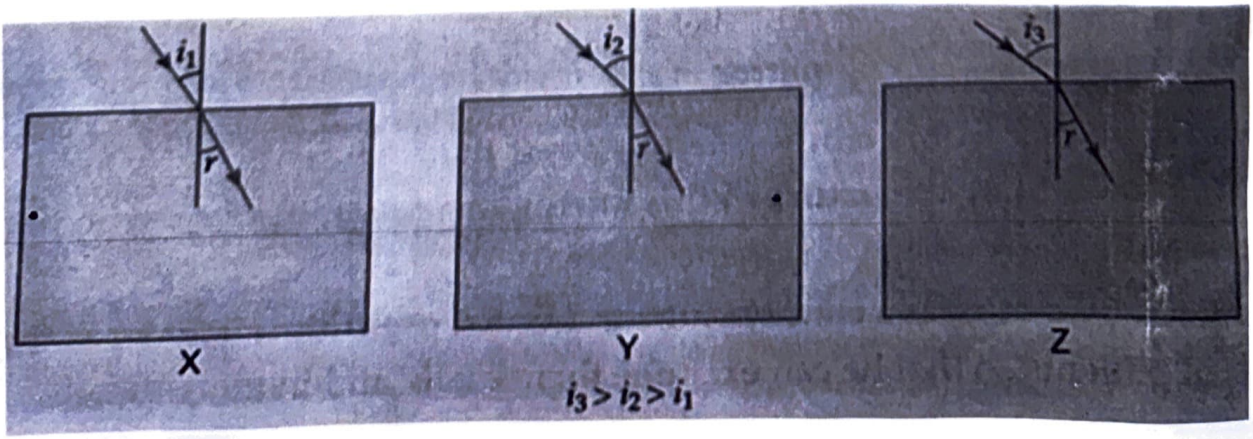
Reason (R): The power of a lens is directly proportional to its focal length, and for a combination of thin lenses in contact, the total power is the algebraic sum of their individual powers.

Q 33. (a) What is scattering of light?

(b) How does the colour of scattered light depend on the size of the scattering particles? 2

Q34. (a) Calculate the refractive index of the material of a glass slab. Given that the speed of light through the glass slab is 2.25 x10^8m/s and in the air is 3 x 10^8 m/s.

(b) The image below shows the refraction of light in three transparent rectangular blocks, X, Y, and Z, made of different materials, when they are placed in air. The angle of

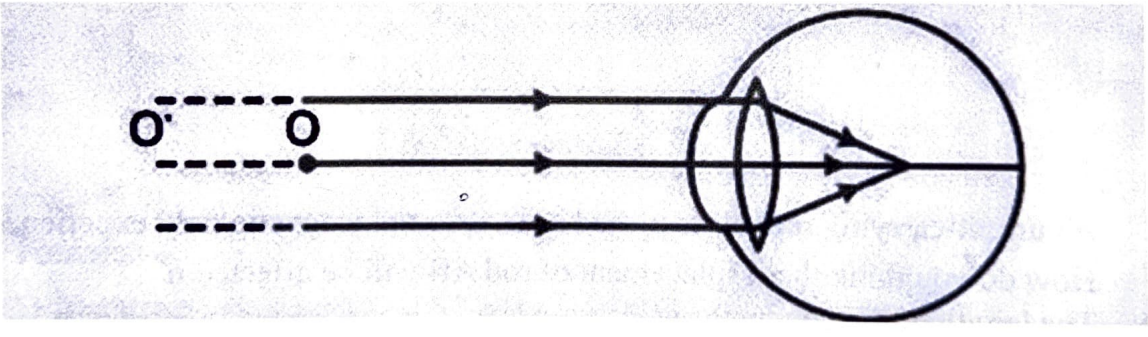


incidence is different in each case ($i_3 > i_2 > i_1$), but the angle of refraction is the same in all three blocks. The speed of light is the maximum in which of the three blocks? Justify your answer. 2

Q35. Rohit focused the image of a candle flame on a white screen using a convex lens. He noted down the position of the candle, screen, and lens as under:
Position of candle = 26 cm
Position of convex lens = 50 cm
Position of screen =.74 cm

(a) What is the focal length of the convex lens?
(b) Where will the image be formed if he shifts the candle towards the lens at a position of 38cm?
(c) Draw a ray diagram to show the formation of the image in case(b). 3

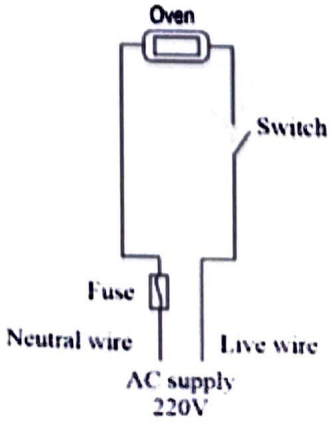
Q36. Study the diagram given below and answer the question that follow



(i) Name the defect of vision represented in the diagram. State any one cause of this defect.
(ii) Redraw the diagram and show how a corrective lens resolves this defect? Label the lens type and focal length. 3

Q37(a) State Joule's law of heating.

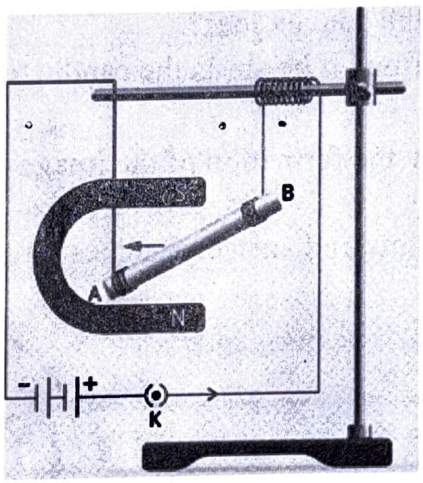
(b) In the diagram below



(i) In case of an overload, will the fuse protect the electric oven from damage?

(ii) If the oven has a rating of 13A, what should be the minimum rating of the fuse? 3

Q 38. A student was asked to perform an experiment to study the force on a current-carrying conductor in a magnetic field. He took a small aluminium rod AB, a strong horseshoe magnet, some connecting wires, a battery, a switch and connected them as shown. He observed that on passing current, the rod gets displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon answer the following questions:



(i) A current-carrying rod AB is placed in an external magnetic field experience a force. How do you think the displacement of rod AB will be affected if

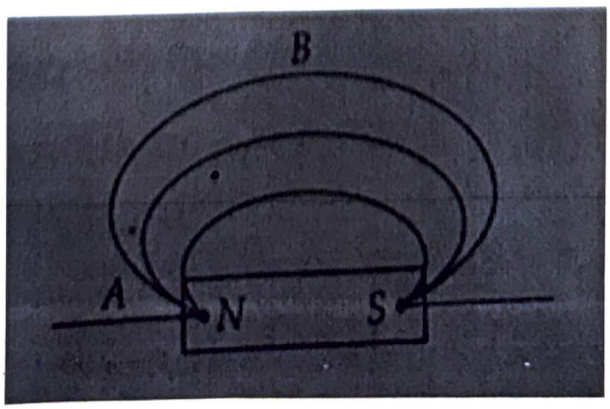
(a) The length of the conductor is increased

(b) A stronger horseshoe magnet is used.

(ii) Name and state the rule that gives the direction of force acting on the conductor.

(iii) A student claims that the magnetic field at point A are stronger than at point B. Explain this observation based on the magnetic field line pattern.

Redraw the diagram and indicate the direction of magnetic field around



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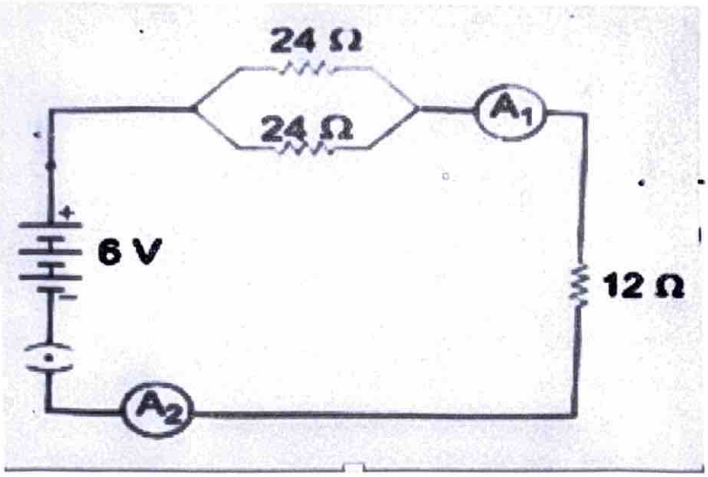
Q39. (a) Two wires P and Q are made of different materials having resistivities p1 and p2, respectively. Their lengths L and cross sectional areas are as follows: (2L, A) and (L,2A)

(i) Find out the expression for the ratio of their resistances R_P:R_Q

(ii) If p1 = 3p2, which wires will have higher resistance?

(b) Study the given circuit and find out:



(i) Current in 12ohm resistor current

(ii) Potential across 12ohm resistor

(iii) Difference in the reading of A1 and A2 if any. 5