KV DELHI REGION

Pre Board Examination 2025-26

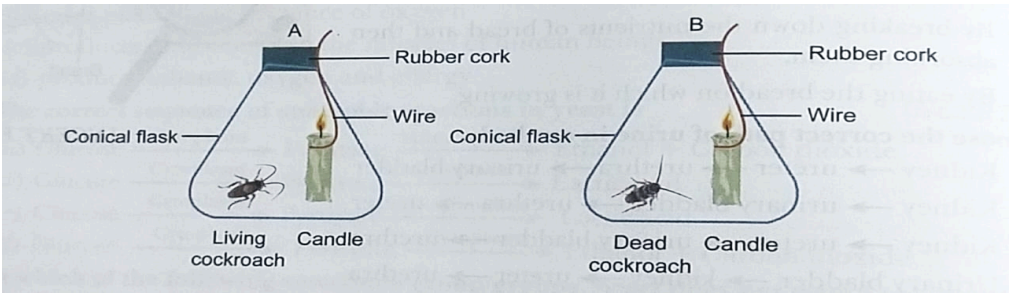
Class :-10 **Subject :-SCIENCE**

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

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.

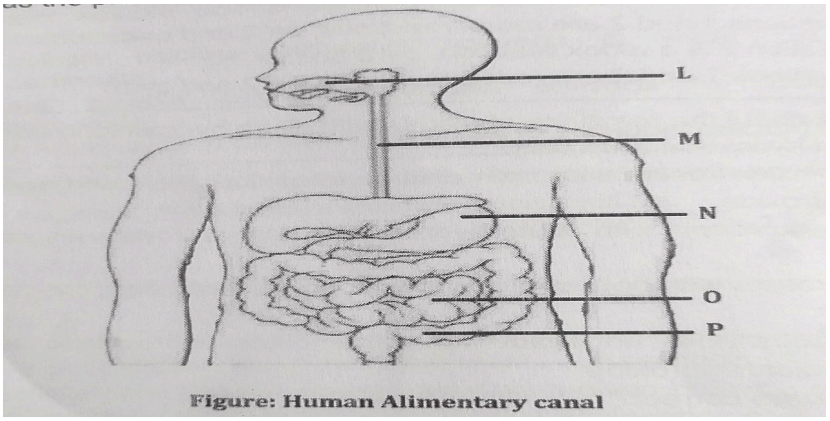
(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

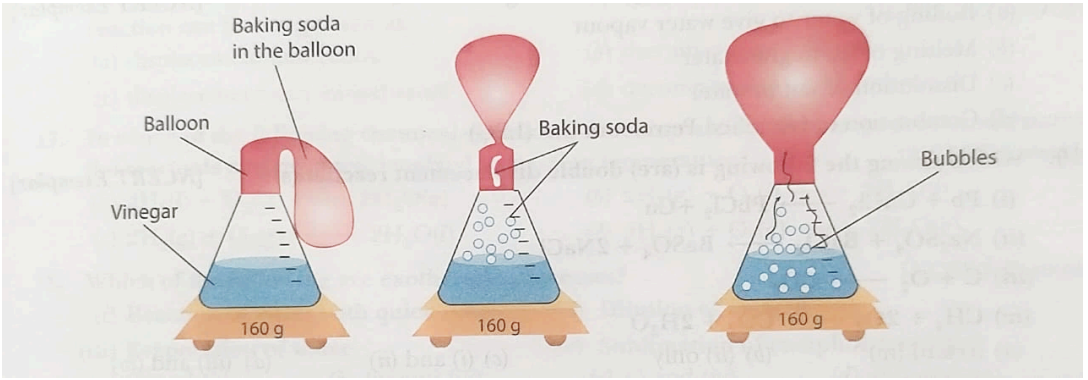
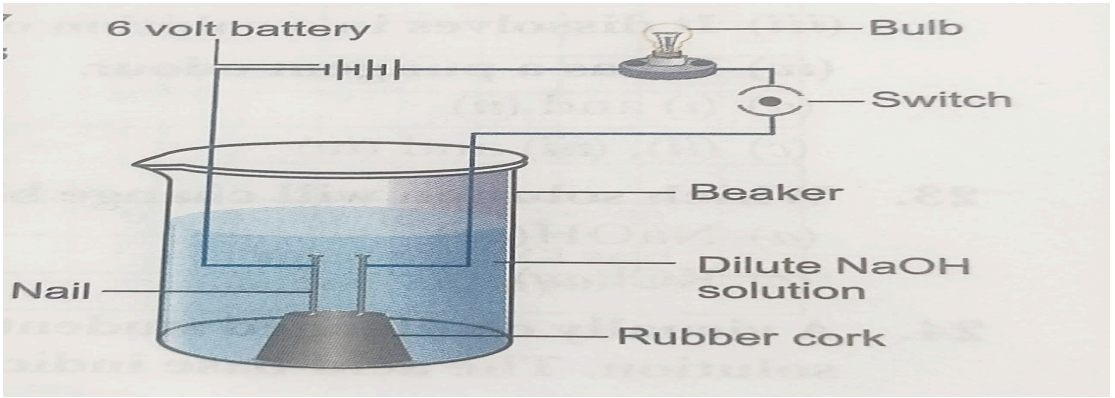
<table>
<tr><td></td><td>Section – A</td><td>Marks</td></tr>
<tr><td>1</td><td>A student set up an experiment to study the human respiratory system. In the experiment, the student places a candle and a living cockroach in flask A, while a candle and a dead cockroach are placed in flask B. The burning of a candle needs oxygen.
 

After 10 minutes, the student observes that the candle in flask A extinguishes faster, while the candle in flask B keeps burning for a longer time.
What can be evaluated from this experiment?
(A) Water vapours produced by living beings prevent burning of candle.
(B) beings conLiving sume oxygen during respiration.
(C) Burning of candle decreases the life span of cockroach.
(D) Candle produces high amount of carbon dioxide.</td><td>1</td></tr>
<tr><td>2</td><td>Match the Terms in Column (A) with Column (B)
<table>
<tr><td>Column (A)</td><td>Column (B)</td></tr>
<tr><td>(A) Trypsin</td><td>(i) Pancreas</td></tr>
<tr><td>(B) Amylase</td><td>(ii) Liver</td></tr>
<tr><td>(C) Bile</td><td>(iii) Gastric Glands</td></tr>
<tr><td>(D) Pepsin</td><td>(iv) Saliva</td></tr>
</table>
Options:
(a) A–(i), B–(iv), C–(ii), D–(iii)
(b) A–(ii), B–(i), C–(iv), D–(iii)
(c) A–(iv), B–(ii), C–(iii), D–(i)</td><td>1</td></tr>
</table>

	(d) A–(ii), B–(iii), C–(iv), D–(i)	
3	Which option correctly shows the order of events when a bright light is focused on our eyes? (A) Bright light → receptors in eyes → sensory neuron → spinal cord → motor neurons → eyelid closes (B) Bright light → receptors in eyes → spinal cord → sensory neuron → motor neurons → eyelid closes (C) Bright light → receptors in eyes → sensory neuron → motor neurons → spinal cord → eyelid closes (D) Bright light → receptors in eyes → spinal cord → motor neurons → sensory neuron → eyelid closes	1
4	In this given Figure, the parts A, B and C are sequentially (A) cotyledon, plumule and radicle (B) plumule, radicle and cotyledon (C) plumule, cotyledon and radicle (D) radicle, cotyledon and plumule **For visually impaired students** The first structure to emerge during seed germi (A) plumule (B) cotyledon (C) radicle (D) seed coat	1
5	In human males all the chromosomes are paired perfectly except one. This/these unpaired chromosome is/are (i) Normal chromosome- Y-chromosome (ii) Short chromosome X-chromosome (iii) short chromosome Y-chromosome (iv) normal chromosome -X-chromosome (A) (i) and (ii) only (B) (ii) only (C) (iii) and (iv) (D) (ii) and (iv)	1
6	In the given food chain, suppose the amount of energy at fourth trophic level is 5 kJ, what will be the energy available at the producer level? Grass → Grasshopper → Frog → Snake → Hawk (A) 5 kJ (B) 50 kJ (C) 500 kJ (D) 5000 kJ	1
7	Excessive exposure of humans to UV-rays may results in (i) Skin irritation (ii) damage to lungs (iii) skin cancer (iv) peptic ulcers (A) (i) and (ii) (B) (i) and (iv) (C) (i) and (iii) (D) (iii) and (iv)	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. A and R are true, and R is the correct explanation of A.		

B. Both A and R are true, and R is nBoth ot the correct explanation of A. C. A is true but R is false. D. A is false but R is true.		
8	Assertion (A): The sex of a child in human beings will be determined by the type of chromosome he/she inherits from his/her father. Reason (R): The child who inherits 'X' chromosome from his father would be a girl (XX), while a child who inherits a 'Y' chromosome from the father would be a boy (XY).	1
9	Assertion (A): A greater number of individuals are present at lower trophic levels in an ecosystem. Reason (R): The flow of energy in an ecosystem is unidirectional.	1
10	A) Rate of breathing in aquatic organisms is much faster than that in terrestrial organisms. Give reasons. (B) Complete the following pathway showing the breakdown of glucose: Glucose (6-carbon molecules) → (i) ___? (3-carbon molecules) in cytoplasm ----------→ (ii) ___ ?+ H_2O + Energy	2
11	**Student to attempt either option (i) OR (ii)** **(i) Give reasons** (A) Ventricles have thicker muscular walls than atria. (B) Transport system in plants is slow. **OR** **(ii)Give reasons** A) Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates. (B) During the daytime, water and minerals travel faster through xylem as compared to the night.	2
13	Write in tabular form the location and function of the hormones secreted by each of the following glands present in the human body: (a) Pituitary gland (b) Thyroid gland (c) Pancreas	3
14	A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other. (a) List your observations regarding (i) Colour of stem in their F_1 progeny (ii) Percentage of brown stemmed plants in F_2 progeny if F_1 plants are self-pollinated (iii) Ratio of GG and Gg in the F_2 progeny (b) Based on the findings of this cross, what conclusion can be drawn?	3
15	Soumya consumed boiled sweet potatoes and boiled eggs for breakfast. Help her to understand some steps in the process of digestion of the food taken by her by answering the questions given below. **Attempt either subpart A or B.** A. Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required with the digestion here. **OR** B. Which of these food items contains fats? How is it digested?	

	C. Which of these food items is rich in starch? How is its digestion initiated? **D**. The figure given below represents parts of the human alimentary canal. Which of these parts will have the maximum amount of digested food as soon as the process of digestion is completed? **<u>For visually impaired students</u>** D. Name the longest and shortest part of alimentary canal.  Figure: Human Alimentary canal	
16	(a) List three different categories of contraception methods. (b) Why has Government of India prohibited prenatal sex determination by law? State its benefits in the long run. (c) Unsafe sexual act can lead to various infections. Name two bacterial and two viral infections caused due to unsafe sex. OR (a) Draw a diagram showing germination of pollen on stigma of a flower and mark on it the following organs/parts: (i) Pollen grain (ii) Pollen tube (iii) Stigma (iv) Female germ-cell (b) State the significance of pollen tube. (c) Name the parts of flower that develop after fertilisation into: (i) Seed (ii) Fruit	5
	Section – B	
17	In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution: (A) exchange of atoms takes place (B) exchange of ions takes place (C) a precipitate is produced (D) an insoluble salt is produced The correct option is: (a) (A) and (B) (b) (A) and (C) (c) only (B) (d) (B), (C) and (D)	1

18	A student poured 100 mL of water in a conical flask and added 40 mL vinegar to it. A balloon was filled with 20 g baking soda and was fixed at the mouth of the conical flask. Slowly the shape of the balloon changed, as shown.  The student claims that a chemical change happened when the two substances were mixed. Is the claim made by the student, correct? (a) Yes, as a new substance was formed in the form of a gas. (b) No, as the formation of bubbles in the mixture shows a physical change. (c) Yes, as the mass remains the same throughout the experiment. (d) No, as the change in the shape and size of the balloon shows a physical change.	1
19	In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus was set up.  Which among the following statement(s) is(are) correct? (i) Bulb will not glow because electrolyte is not acidic (ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction. (iii) Bulb will not glow because circuit is incomplete (iv) Bulb will not glow because it depends upon the type of electrolytic solution (a) (i) and (iii) (b) (ii) and (iv) (c) (ii) only (d) (iv) only **<u>For visually impaired students</u>** Which of the following is a strong electrolyte? (a) Vinegar (b) Tap water	1

	(c) Hydrochloric acid (d) Sugar	
20	If 10 mL of H_2SO_4 is mixed with 10 mL of $Mg(OH)_2$ of the same concentration, the resultant solution will give the following colour with universal indicator: (a) Red (b) Yellow (c) Green (d) Blue	1
21	An element 'X' reacts with O_2 to give a compound with a high melting point. This compound is also soluble in water and it's solution is used in white washing of walls. The element 'X' is likely to be: (a) iron (b) calcium (c) zinc (d) copper	1
22	A student adds an equal amount of copper sulphate solution in two beakers. He adds zinc in beaker P and silver in beaker Q. The student observes that the color of the solution in beaker P changes while no change is observed in beaker Q. Which option arranges the metals in increasing order of reactivity? (a) Copper–silver–zinc (b) Zinc–copper–silver (c) Silver–copper–zinc (d) Silver–zinc–copper	1
23	A student conducts an activity where he took a naphthalene ball and burnt it. He observed that it gives a yellow flame with lots of black smoke and sooty deposits around it. What type of hydrocarbon does naphthalene contain? (a) Unsaturated, as sooty deposit represents unburnt hydrocarbons. (b) Unsaturated, as black smoke represents complete combustion. (c) Saturated, as the burning of any substance represents a complete combustion. (d) Saturated, as it gives a yellow flame which represents complete combustion.	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.		
24	Assertion (A): Following are the members of a homologous series: CH_3OH, CH_3CH_2OH, $CH_3CH_2CH_2OH$ Reason (R): A series of compounds with same functional group but differing by $-CH_2$ unit is called a homologous series.	1
25	Silver articles become black when kept in open for some time, whereas copper vessels lose their shine and gain a green coat when kept in open. Name the substances present in air with which these metals react and write the name of the products formed.	2
26	**<u>Attempt either option A OR B</u>** (A) On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed. (i) Write a balanced chemical equation of the reaction. (ii) Identify the brown gas X evolved. (iii) Identify the type of reaction.	3

<table>
<tr><td></td><td>(iv) What could be the pH range of aqueous solution of the gas X?

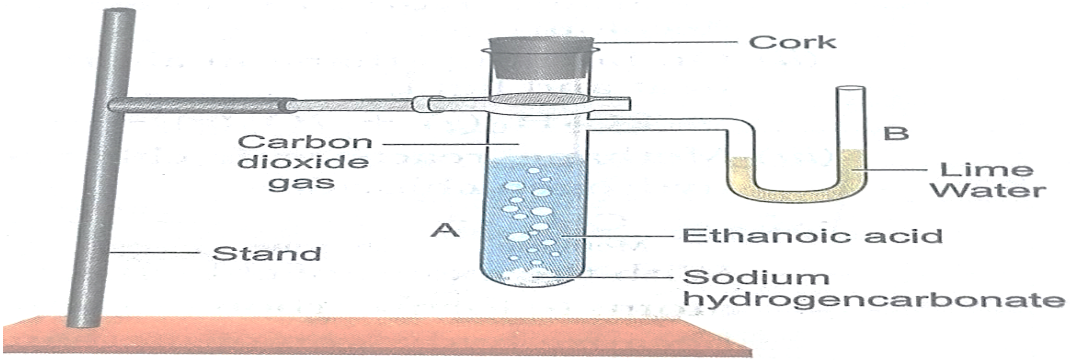
<u>OR</u>
(B) 1 g of copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen gas is passed over this heated substance, a visible change is seen in it. Give the chemical equations of reactions, the name and the color of the products formed in each case.</td><td></td></tr>
<tr><td>27</td><td>a) What is thermit process? Where is this process used? Write balanced chemical equation for the reaction involved.
(b) Name the substances that are getting oxidised and reduced in the process.</td><td>3</td></tr>
<tr><td>28</td><td>Frothing in Yamuna
The primary reason behind the formation of the toxic foam is high phosphate content in the wastewater because of detergents used in dyeing industries, dhobi ghats and households. Yamuna's pollution level is so bad that parts of it have been labelled 'dead' as there is no oxygen in it for aquatic life to survive.

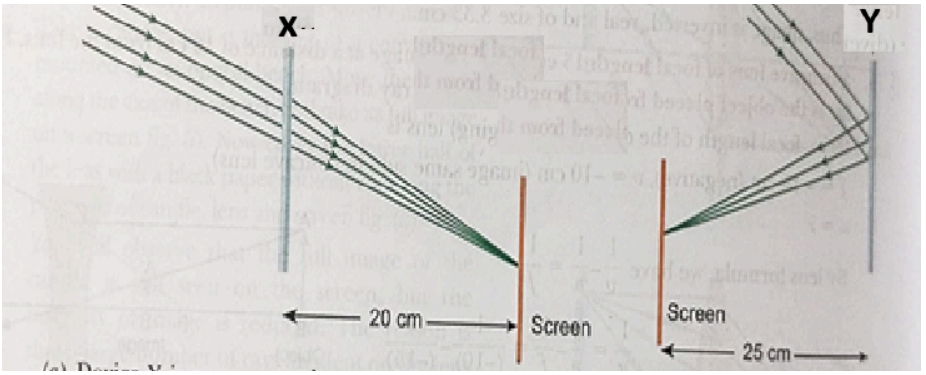
Questions:
(i) Predict the pH value of the water of river Yamuna if the reason for froth is high content of detergents dissolved in it.
a) 10-11
b) 5-7
c) 2-5
d) 7

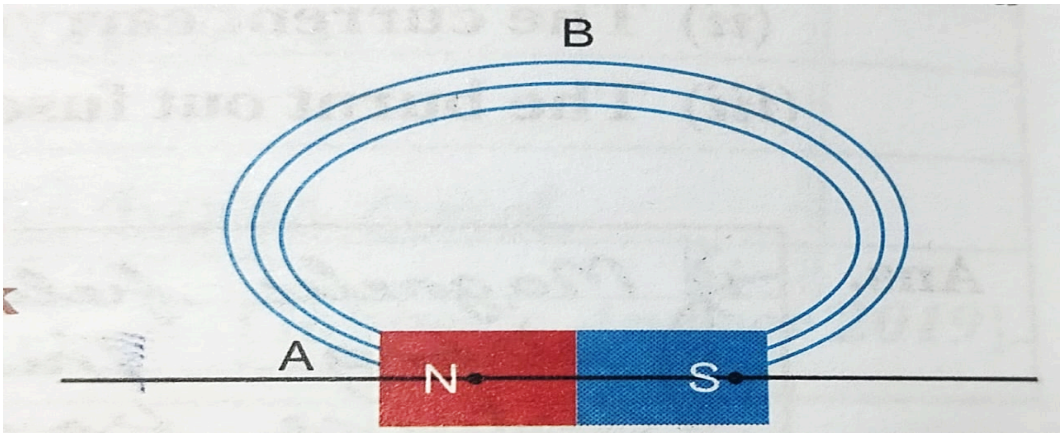
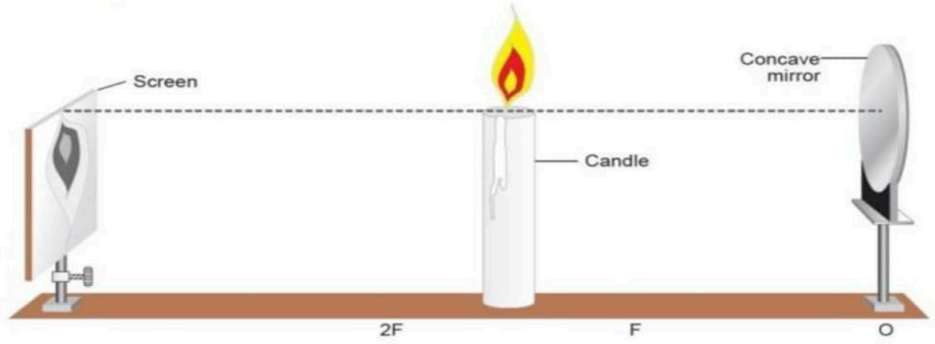
(ii) Which of the following statements is correct for the water with detergents dissolved in it?
a) low concentration of hydroxide ion (OH^-) and high concentration of hydronium ion (H_3O^+)
b) high concentration of hydroxide ion (OH^-) and low concentration of hydronium ion (H_3O^+)
c) high concentration of hydroxide ion (OH^-) as well as hydronium ion (H_3O^+)
d) equal concentration of both hydroxide ion (OH^-) and hydronium ion (H_3O^+)

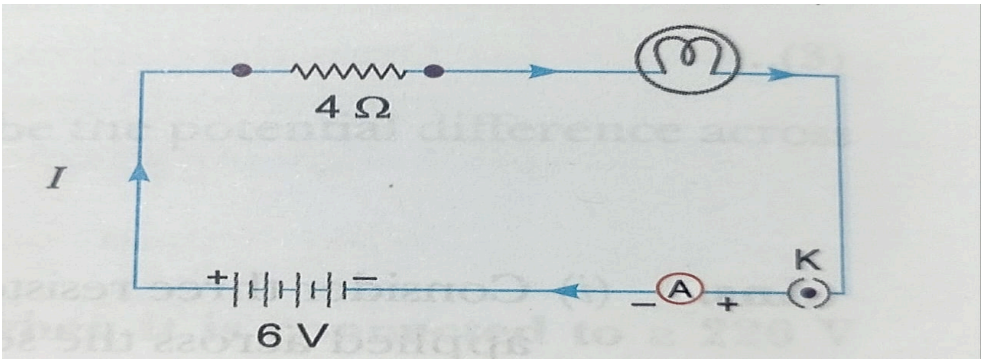
(iii) The table provides the pH value of four solutions P, Q, R and S:

<table><tr><td>Solution</td><td>pH value</td></tr><tr><td>P</td><td>2</td></tr><tr><td>Q</td><td>9</td></tr><tr><td>R</td><td>5</td></tr><tr><td>S</td><td>11</td></tr></table>
Which of the following correctly represents the solutions in increasing order of their hydronium ion concentration?
a) P > Q > R > S
b) P > S > Q > R</td><td>4</td></tr>
</table>

	c) S < Q < R < P d) S < P < Q < R (iv) High content of phosphate ion in river Yamuna may lead to: a) decreased level of dissolved oxygen and increased growth of algae b) decreased level of dissolved oxygen and no effect on growth of algae c) increased level of dissolved oxygen and increased growth of algae d) decreased level of dissolved oxygen and decreased growth of algae **OR** (iv)If a sample of water containing detergents is provided to you, which of the following methods will you adopt to neutralize it? a) Treating the water with vinegar b) Treating the water with baking soda c) Treating the water with caustic soda d) Treating the water with washing soda	
29	**Attempt either option A OR B** (A) A compound C (molecular formula, $C_2H_4O_2$) reacts with Na-metal to form a compound R and evolves a gas which burns with a pop sound. Compound C on treatment with an alcohol A in presence of an acid forms a sweet-smelling compound S (molecular formula $C_3H_6O_2$). On addition of NaOH to C, it also gives R and water. S on treatment with NaOH solution gives back R and A. Identify C, R, A, S and write down the reactions involved. **OR** (B)Look at the figure and answer the following questions:  (i) What change would you observe in the calcium hydroxide solution taken in tube B? (ii) Write the reaction involved in A and B respectively. (iii) If ethanol is given instead of ethanoic acid, would you expect the same change? (v) How can a solution of lime water be prepared in the laboratory? **For visually impaired students** (B) i) What happens when 5% alkaline $KMnO_4$ solution is added drop by drop to warm ethanol taken in a test tube? State the role of alkaline $KMnO_4$ solution in this reaction. (ii) Two carbon compounds X and Y have the molecular formula C_4H_8 and C_5H_{12} respectively. Which one of the these is most likely to show addition reaction? Justify	5

	your answer. Also give chemical equation to explain the process of addition reaction in this case.	
	Section – C	
30	Study the given ray diagrams and select the correct statement from the following:  (a) Device X is a concave mirror and device Y is a convex lens, whose focal lengths are 20 cm and 25 cm respectively. (b) Device X is a convex lens and device Y is a concave mirror, whose focal lengths are 10 cm and 25 cm respectively. (c) Device X is a concave lens and device Y is a convex mirror, whose focal lengths are 20 cm and 25 cm respectively. (d) Device X is a convex lens and device Y is a concave mirror, whose focal lengths are 20 cm and 25 cm respectively **<u>For visually impaired students</u>** A ray passing through the Centre of curvature of a concave mirror- (a) Bends toward principal axis (b) Reflects back along the same path (c) Becomes parallel to principal axis (d) Always diverge	1
31	The sky appears dark to passengers flying at very high altitudes mainly because: (a) Scattering of light is not enough at such heights. (b) There is no atmosphere at great heights. (c) The size of molecules is smaller than the wavelength of visible light. (d) The light gets scattered towards the earth.	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.		
32	Assertion (A): When the object moves with a velocity 2 m/s, its image in the plane mirror moves with a relative velocity of 4 m/s with respect to object. Reason (R): The image formed by a plane mirror is as far behind the mirror as the object is in front of it.	1
33	Name the type of mirror used in following situations: (i) Headlights of a car. (ii) Side/Rear-view mirror of a vehicle. Support your answer with reason.	2

34	Compute the heat generated while transferring 98000 coulombs of charge in two hours through a potential difference of 40 V.	2
35	(a) A person is suffering from both myopia and hypermetropia. (i) What kind of lenses can correct this defect? (ii) How are these lenses prepared? (b) A person needs a lens of power +3D for correcting his near vision and –3D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.	3
36	Explain the following: (i) Why is the tungsten used almost exclusively for filament of electric lamps? (ii) Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal? (iii) Why is the series arrangement not used for domestic circuits?	3
37	Magnetic field lines are shown in the given diagram. A student could not identify that the magnetic field at 'A' is stronger or magnetic field at 'B' is stronger. Help him to identify, Justify your answer. Also redraw the diagram and mark the direction/arrow of magnetic field lines. .  **<u>For visually impaired students</u>** Explain how the magnetic field around a solenoid is similar to that of a bar magnet. Write any two applications of solenoids.	3
38	 We know that the characteristics of image formed by a concave mirror depend on the position of the object with respect to the mirror. When an object is placed between F and infinity, the image formed is real and inverted. But when the object is placed between F and mirror it cannot be obtained on the screen. The image formed in this	4

	case is virtual, erect and magnified. Such image may be seen by looking in the mirror directly. When the object is moved from focus towards infinity, the image moves from infinity towards focus and its size decreases. When object is placed at 2 F image of the same size is formed at 2 F , itself. (i) What will be the nature of image if an object is placed 10 cm in front of a concave mirror of focal length 20 cm ? (ii) What is the minimum distance between the object and its real image for r4concave mirror? (iii) A candle flame 3 cm high is placed at a distance of 3 m from a wall. How far from the wall must a concave mirror be placed in order that it may form an image of the flame 9 cm high on the wall? **OR** (iii) Draw a ray diagram when an object is placed near a concave mirror at a distance of one fourth the radius of curvature of the concave mirror?	
39	**Attempt either option A OR Bj** (A) (i)With the help of a suitable circuit diagram, prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances. (ii) In an electric circuit two resistors of 12 Ω each are joined in parallel to a 6 V battery. Find the current drawn from the battery. **OR** (B) An electric lamp of resistance 20 Ω and a conductor of resistance 4 Ω are connected to a 6 V battery as shown in the circuit.  Calculate: (i) total resistance of the circuit, (ii) current through the circuit, (iii) potential difference across the (a) electric lamp and (b) conductor, and (iv) power of the lamp. **For visually impaired students** (B) A conductor of resistance 4 Ω and an electric bulb of resistance 20 Ω are connected in series to a 6 V battery. Calculate: (i) total resistance of the circuit, (ii) current through the circuit, (iii) potential difference across the (a) electric bulb and (b) 20 Ω conductor	5

	(iv) power of the electric bulb.	