

S-2
MID TERM EXAMINATION - 2024
SCIENCE (SET-II)

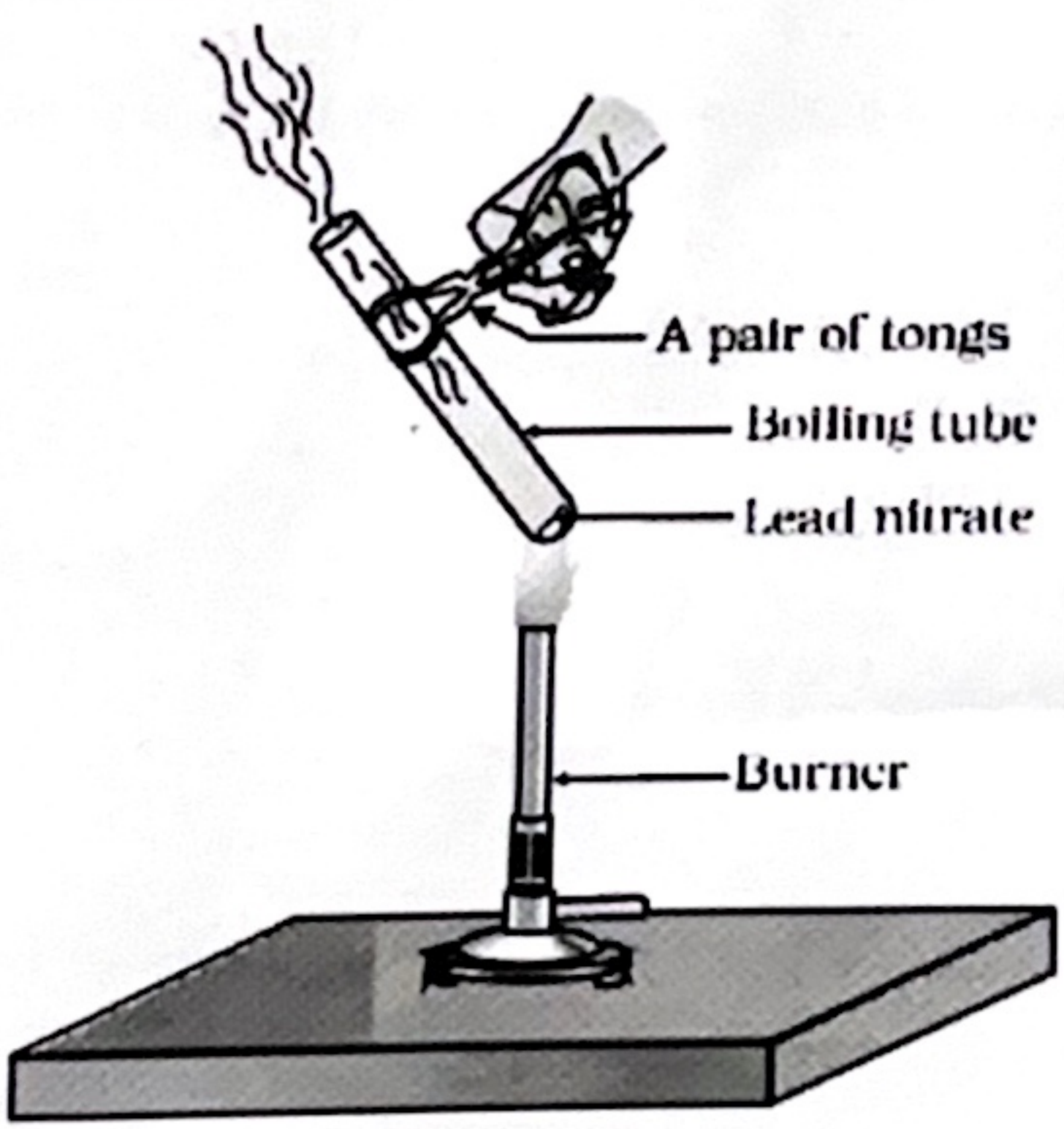
TIME DURATION: 3 hours

M.M.: 80

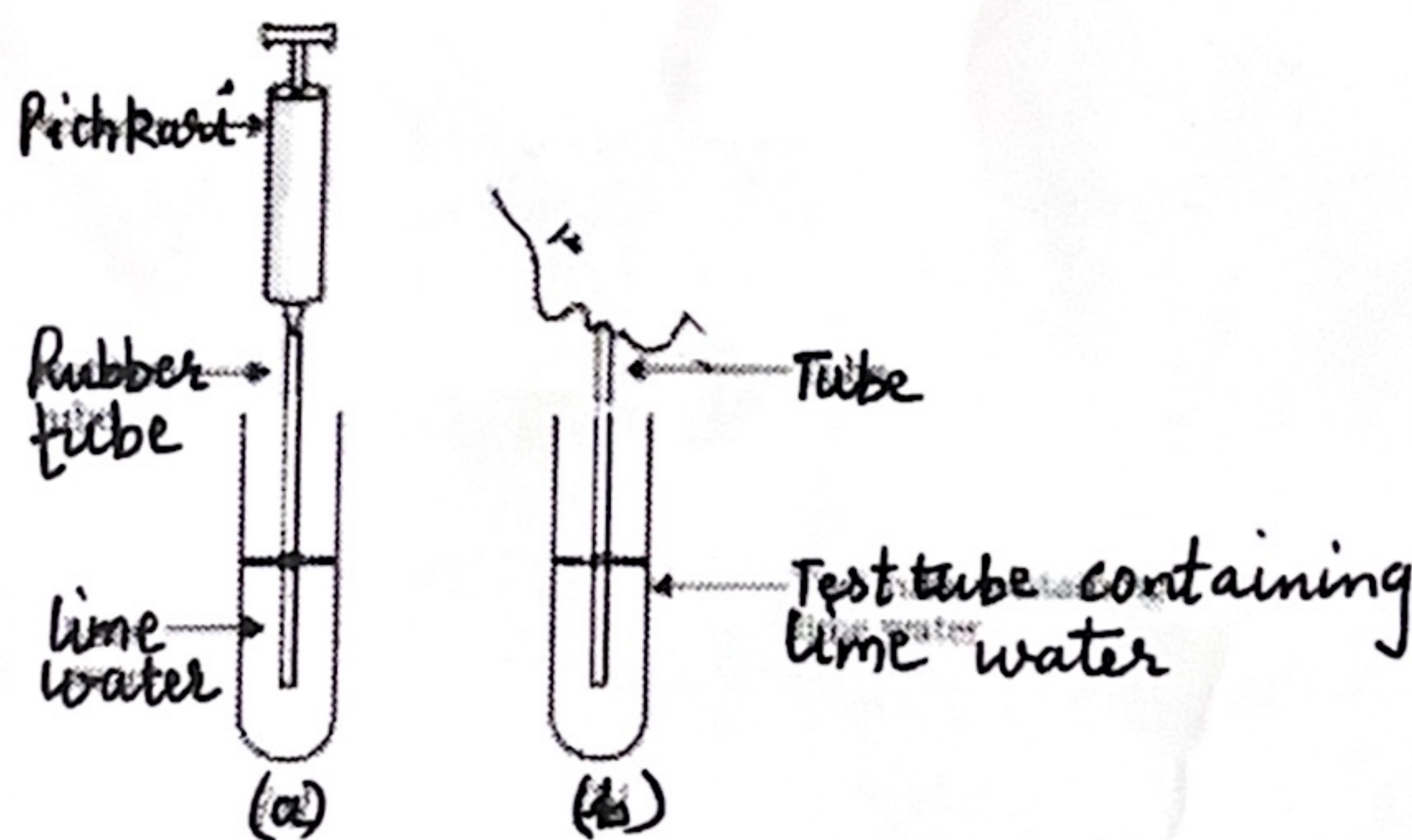
General Instructions:

1. This question paper consists of 10 printed pages.
2. This question paper consists of 39 questions in 5 sections.
3. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
4. Section A consists of 20 objective type questions carrying 1 mark each.
5. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
6. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
7. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
8. Section E consists of 3 source-based/case-based units of assessment of 04 marks, each with sub-parts.

Section A (1 × 20 = 20)

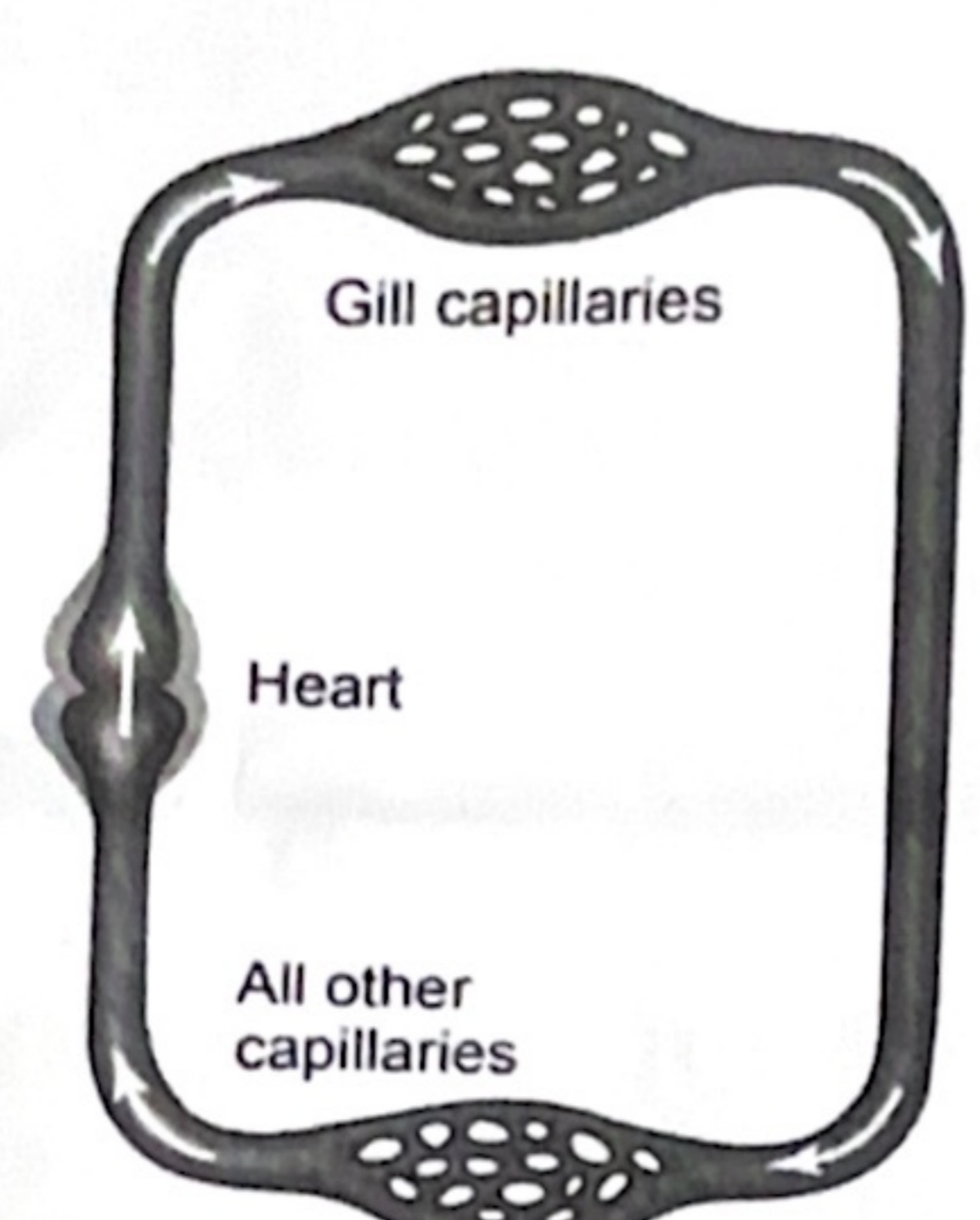
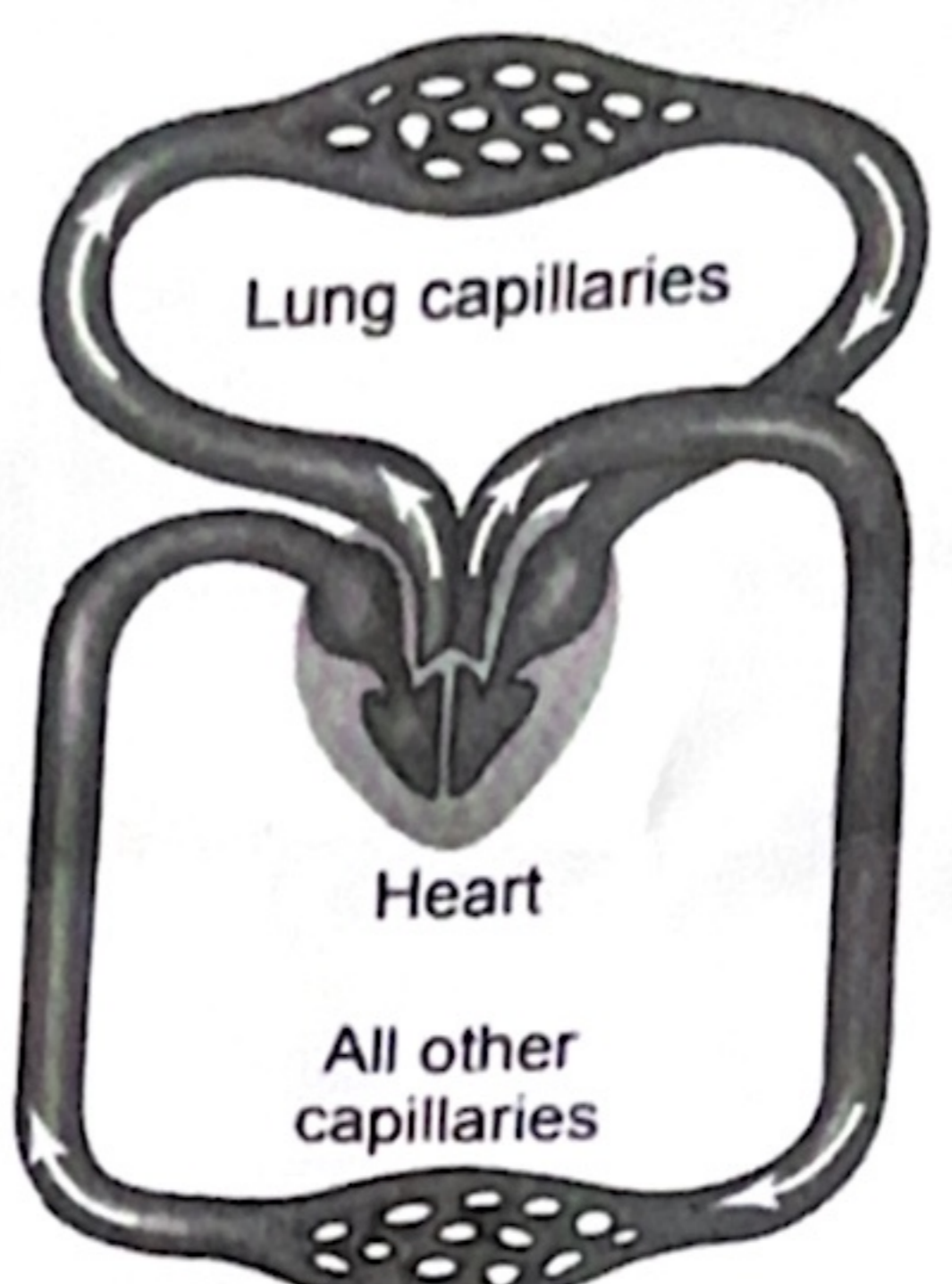
1	What will be the action of the following substances on litmus paper? a. Dry HCl gas b. Lemon juice	1
2	The emission of brown fumes in the given experimental set up is due to the formation of _____ <div style="text-align: center;">  </div>	1
3	Name a metal and a non-metal that exists in liquid state at room temperature.	1

4	Write an equation to show the reaction between Plaster of Paris and water.	1
5	2 g of silver chloride is taken in a china dish and the china dish is placed in sunlight for sometime. Write the chemical reaction involved in the form of a balanced chemical equation.	1
6	Name two metals that can exist both in the free state and combined state.	1
7	How is the concentration of hydronium ions (H_3O^+) affected when a solution of an acid is diluted?	1
8	Answer the following in one word a. Muscle cramps occur due to accumulation of this chemical during lack of oxygen b. Category of animals in which <u>only</u> deoxygenated blood flows through the heart	1
9	Which of the following statement(s) is (are) true about respiration? (i) During inhalation, ribs move inward and diaphragm is raised (ii) In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood and carbon dioxide from blood into alveolar air (iii) Haemoglobin has greater affinity for carbon dioxide than oxygen (iv) Alveoli increase surface area for exchange of gases	1
10	Explain why during the daytime water and minerals travel faster through xylem as compared to the night.	1
11	In the given activity, the lime water of which test tube will get milky faster? Why?	1



12	When the materials like sucrose are transferred to phloem tissue, the osmotic pressure of the tissue leading to.....of water into it.	1
13	Can we change the focal length of a given spherical mirror by changing the object distance from the mirror?	1
14	If n number of identical resistors of resistance R are connected in parallel combination, then the effective resistance of the combination is _____	1
15	What will happen if the intake of iodine in our diet is low?	1
16	<p>The growth of pollen tubes toward ovules is a result of movement.</p> <p>The following questions from Question 17 to Question 20 consist of two statements —Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>(a) Both A and R are true and R is the correct explanation of A</p> <p>(b) Both A and R are true and R is not the correct explanation of A</p> <p>(c) A is true but R is false</p> <p>(d) A is False but R is true</p> <p>(e) Both A and R are false</p>	1
17	<p>Assertion: Iron articles are painted so as to prevent them from rusting.</p> <p>Reason: When the surface of iron is coated with paint, its surface does not come in contact with oxygen and moisture therefore rusting does not take place.</p>	1
18	<p>Assertion: The movement of water and dissolved salts in xylem is always upwards.</p> <p>Reason: The upward movement of water is due to low pressure created by transpiration.</p>	1
19	<p>Assertion: A ray of light passing through the centre of curvature of a spherical mirror retraces its path after reflection from the mirror.</p> <p>Reason: A ray of light passing through the centre of curvature of a spherical mirror is incident normally on the surface of the mirror.</p>	1
20	<p>Assertion: Insulin regulates blood sugar level</p> <p>Reason: Insufficient secretion of insulin will cause diabetes.</p>	1

Section B (2 X 6 = 12)

21	<p>In an industrial process used for the manufacture of sodium hydroxide, a gas 'A' is formed as a by-product. The gas 'A' reacts with lime water to give a compound 'B' which is used as a bleaching agent in the chemical industry. Identify 'A' and 'B'. Also, give the chemical equation for the reaction involved.</p>	2
22	<p>Give reasons :</p> <p>(a) A boy runs when he sees a stray dog. His breathing becomes very fast and blood pressure also increases.</p> <p>(b) Leaves of sensitive plants like 'touch me not' fold inwards when touched.</p>	2
23	<p>Compare the two types of circulatory pathways depicted in the diagram</p>	2
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>a)</p> </div> <div style="text-align: center;">  <p>b)</p> </div> </div>		
24	<p>A copper wire has diameter 0.5mm and resistivity of $1.6 \times 10^{-8} \Omega m$. What is the length of this wire to make its resistance 10Ω? How much does the resistance change if diameter is doubled?</p>	2
25	<p>Explain the following.</p> <p>a) Why is tungsten used almost exclusively for the filament of electric lamps?</p> <p>b) Why are copper and aluminum wires usually employed for electricity transmission?</p>	2
<p>OR</p>		
<p>Deduce the expression for the equivalent resistance of the parallel combination of three resistors R1, R2, and R3.</p>		

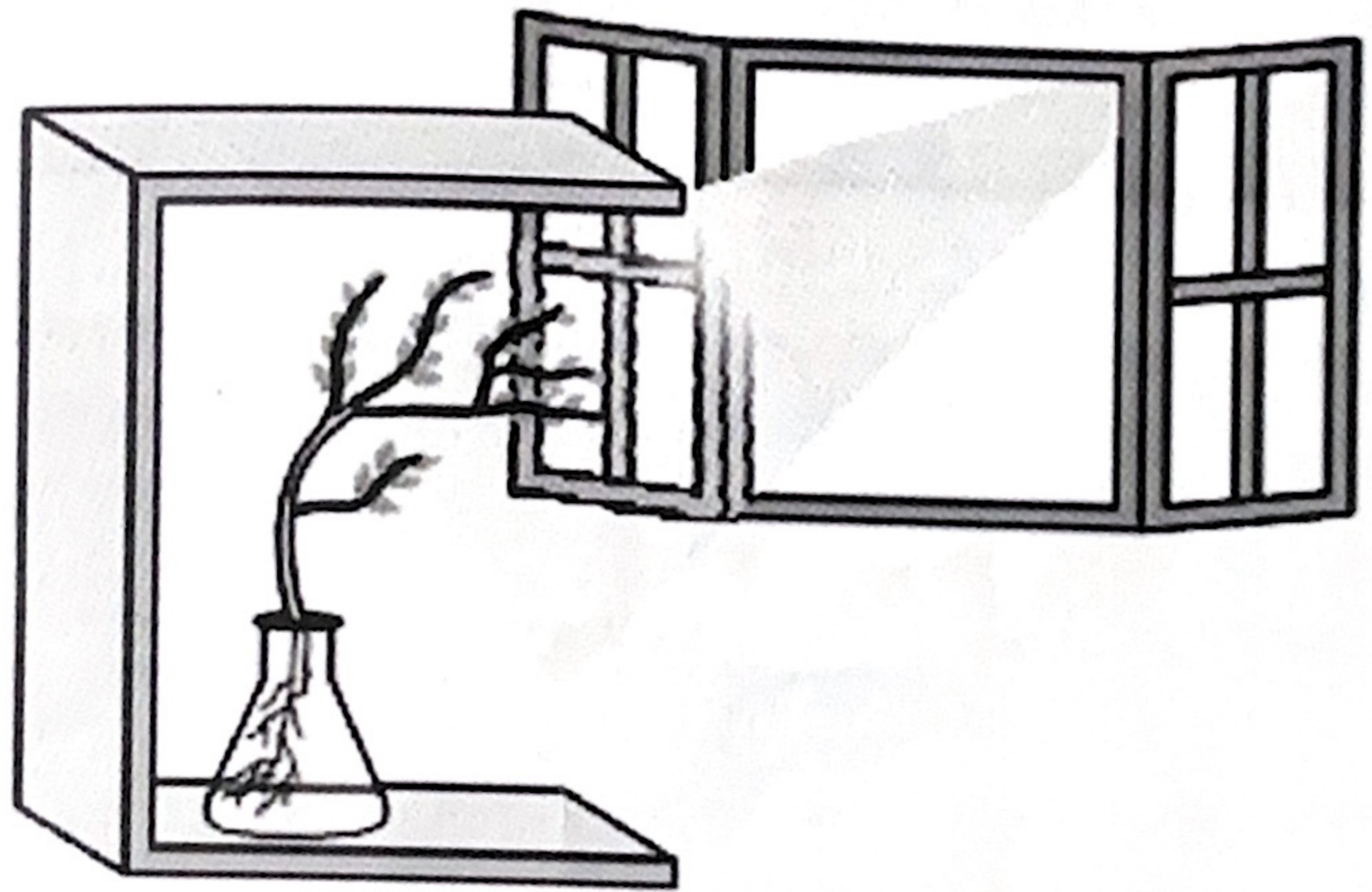
26	a. What will happen if pancreas is surgically removed from the body? b. Mention the end products of respiration occurring in yeast	2
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Section C (3 X 7 = 21)

27	(a) Explain the formation of Calcium Chloride with the help of electron dot structure. (Atomic numbers: Ca=20, Cl=17) (b) Why do ionic compounds not conduct electricity in solid state but conduct electricity in molten and aqueous states?	3
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28	A compound 'X' of sodium is used as an antacid and it decomposes on strong heating. (a) Name the compound 'X' and give its chemical formula. (b) Write the balanced chemical equation to represent the decomposition of 'X'. (c) Give one use of the compound 'X' besides an antacid. <p style="text-align: center;">OR</p> Complete and balance the following chemical equations: (a) $K(s) + H_2O(l) \rightarrow$ (b) $MnO_2(s) + Al(s) \rightarrow$ (c) $Pb(s) + CuCl_2(aq) \rightarrow$	3
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29	Explain the activity depicted in the following diagram	3
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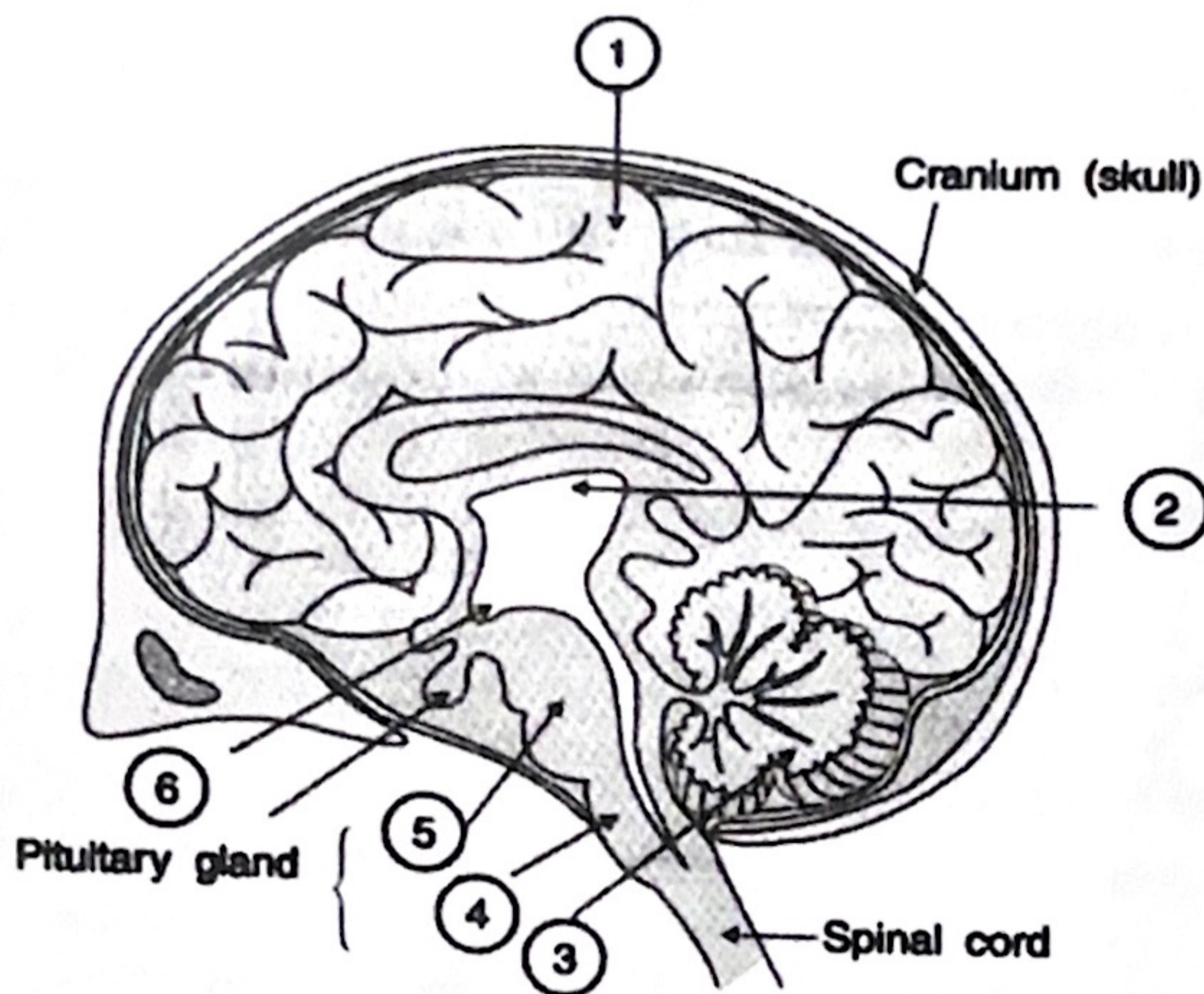
30	<p>(a) Draw diagram of sectional view of human heart and label the following</p> <ol style="list-style-type: none"> vessels which carry blood to the heart. vessel which carries blood away from the heart. blood vessel that brings oxygenated blood to the human heart. chamber of the human heart which receives deoxygenated blood 	3
31	<p>An object placed on a meter scale at 8 cm mark was focused on a white screen placed at 92 cm mark, using a converging lens placed on the scale at 50 cm mark.</p> <ol style="list-style-type: none"> Find the focal length of converging lens. Find the position of image formed if the object is shifted towards the lens at a position of 29.0 cm. State the nature of the image formed if the object is further shifted towards the lens. 	3
32	<p>What is refractive index. For the same angle of incidence of 45°, the refractive angle in two transparent media A and B is 20° and 30° respectively. Which of the two is optically denser and why?</p>	3
33	<p>Two resistors, of resistances 5Ω and 10Ω respectively are to be connected to a battery of 6V so as to obtain</p> <ol style="list-style-type: none"> minimum current flowing maximum current flowing. <p>(a) How will you connect the resistances in each case?</p> <p>(b) Calculate the strength of the total current in the circuit in the two cases.</p>	
Section D (5 X 3 = 15)		
34	<p>(a) Name the substance oxidised and reduced in the following reactions:</p> <ol style="list-style-type: none"> $\text{PbO} + \text{C} \rightarrow \text{Pb} + \text{CO}$ $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$ <p>(b) 2g of ferrous sulphate crystals are heated in a dry boiling tube.</p> <ol style="list-style-type: none"> List any two observations. Name the type of chemical reaction taking place. Write the chemical equation for the reaction. <p style="text-align: center;">OR</p>	5

- (a) Give reason for the following:
- Oil and fats containing food items are flushed with nitrogen
 - A shiny white finish is obtained on the walls after two to three days of white washing.
- (b) Write one chemical equation each for the chemical reaction in which the following have taken place:
- change in colour
 - change in temperature
 - formation of precipitate
- Mention the colour change or the temperature change (rise/fall) or the compound precipitated along with the equation.

35

- a. Observe the diagram and answer the questions that follow

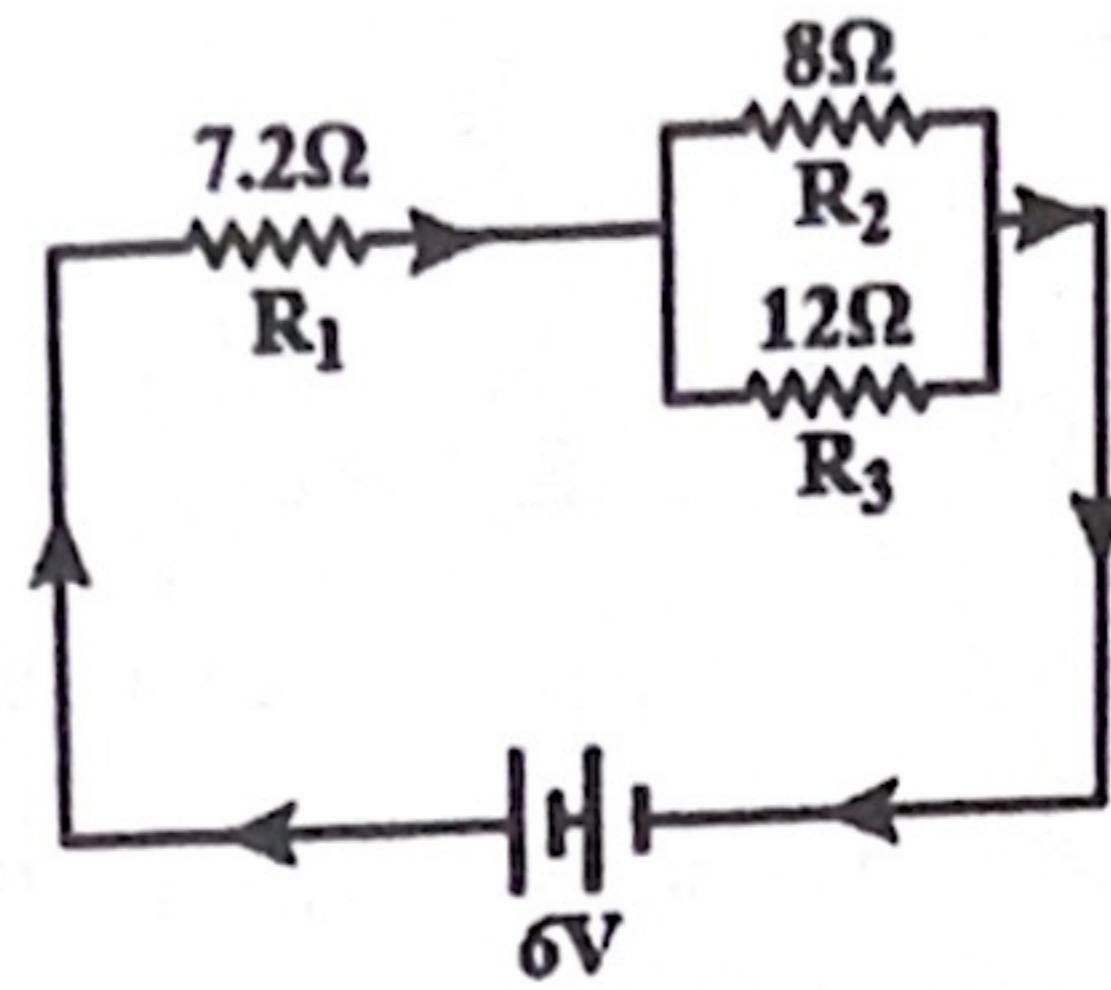
5



- Which of the following structures comprise the hind brain. (1)
 - Explain the role of structure 6 (1)
 - How does the nervous tissue get protected? (2)
- b. How are voluntary actions and involuntary different from each other (1)
- OR**
- You have touched a very hot object. Represent diagrammatically the path that leads to a response. (3)
 - Explain how flow of signals occurs at neuromuscular junction. (2)

36

- a) Define the term 'volt'.
- b) Calculate the potential difference between the two terminals of a battery if 100J of work is required to transfer 20C charge from one terminal of the battery to the other.
- c) In the circuit diagram given below,



- find: (a) total resistance of the circuit.
(b) the potential difference across R1.

OR

- a) State Joule's law of heating.
- b) Derive an expression for the heat produced in a conductor of resistance R when a current I flows through it for some time t
- c) Two identical resistors of resistance R are connected in series with a battery of potential difference V for time t . The resistors are then connected in parallel with the same battery for the same time. Compare the heat produced in the two cases.

Section E
4X3=12

37

Read the passage and answer the questions that follow:

The metals produced by various reduction processes are not very pure. They contain impurities, which must be removed to obtain pure metals. The most widely used method for refining impure metals is electrolytic refining.

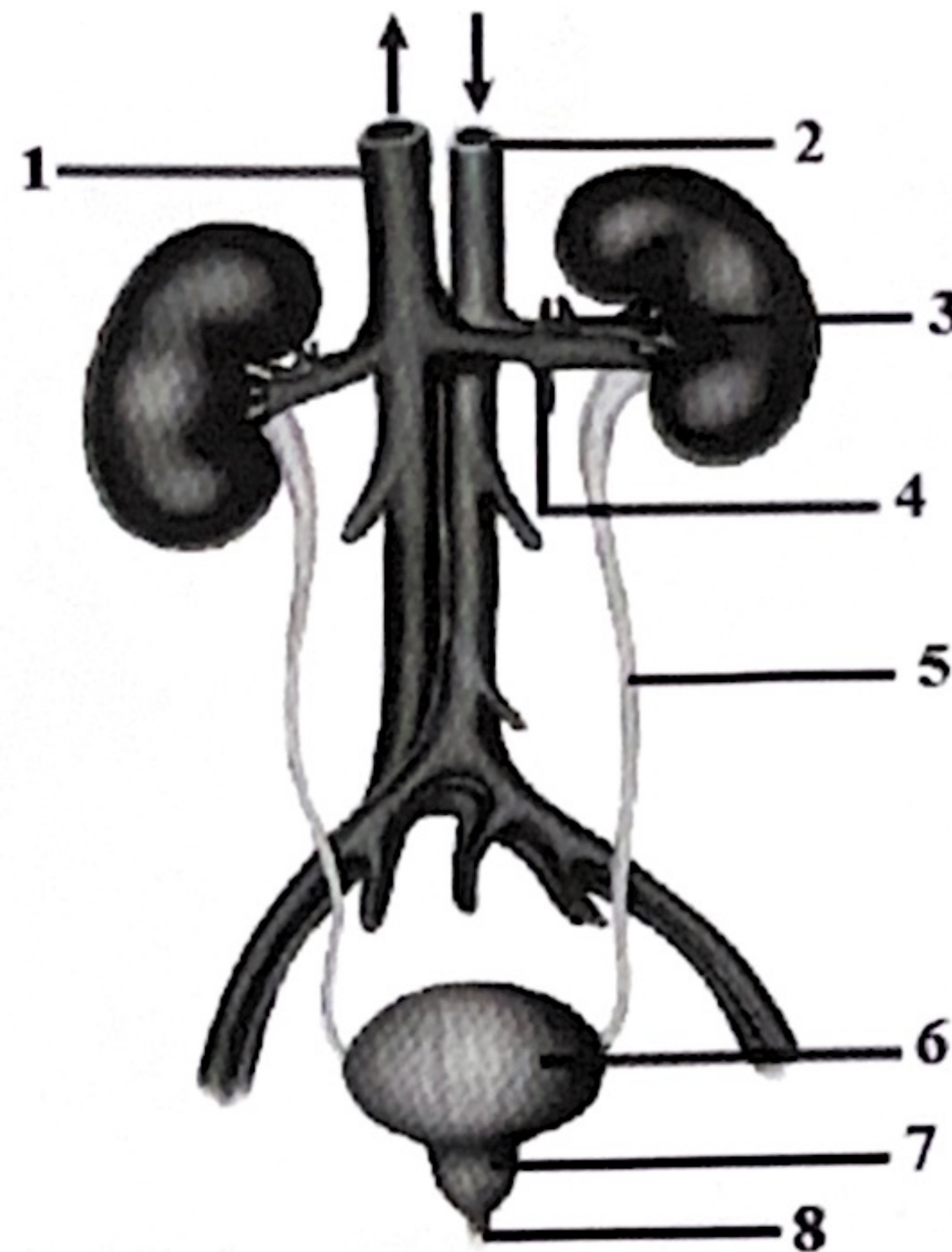
- (a) What is the cathode and anode made of in the refining of copper by this process?
- (b) Name the solution used in the above process and write its formula.
- (c) How copper gets refined when electric current is passed in the electrolytic cell?

OR

- (c) You have two beakers 'A' and 'B' containing copper sulphate solution. What will you observe after two hours, if you dip a strip of zinc in beaker 'A' and a strip of silver in beaker 'B'? Give reason for your observations in each case.

Read the passage and answer the questions that follow:

The excretory system of human beings includes a pair of kidneys, a pair of ureters, a urinary bladder and a urethra. Kidneys are located in the abdomen, one on either side of the backbone. Urine produced in the kidneys passes through the ureters into the urinary bladder where it is stored until it is released through the urethra.



- Identify the blood vessel which carries maximum nitrogenous waste (1)
- Besides filtration of blood, which other function does the kidney perform? (1)
- How is urine production in human body different from dialysis, though both the procedures are helping in removal of impurities from the body (2)

OR

How is the amount of urine produced regulated ?

Read the passage and answer the questions that follow:

A student took three concave mirrors of different focal lengths and performed the experiment to see the image formation by placing an object at different distances with these mirrors as shown in the following

CASE NO,	OBJECT DISTANCE	FOCAL LENGTH
1	46 cm	21 cm
2	32 cm	16 cm
3	21 cm	32 cm

Now answer the following questions

- (a) List two properties of the image formed in Case I.
- (b) In which one of the cases given in the table, the mirror will form real image of same size and why?
- (c) Name the type of mirror used by dentists. Given reason why do they use such types of mirrors.

OR

- (c) Look at the table and identify the situation (object distance and focal length) which resembles the situation in which concave mirrors are used as shaving mirrors? Draw a ray diagram to show the image formation in this case.