

**Delhi Public School R.K. Puram**  
**Sample Paper I (Preboard ), 2024-2025**  
**Class- X**  
**Subject - Science**

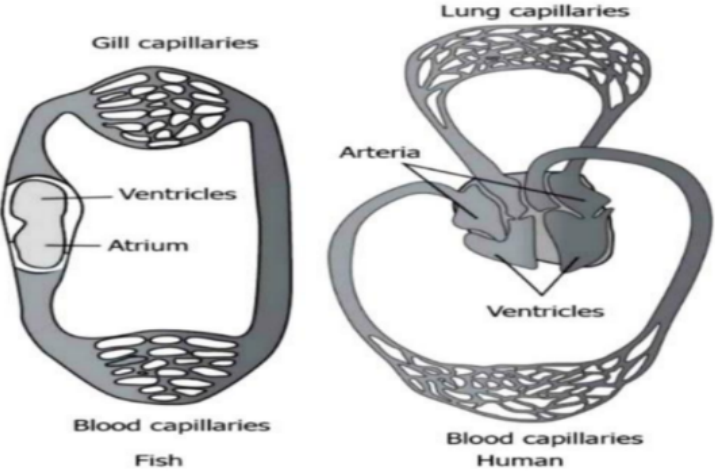
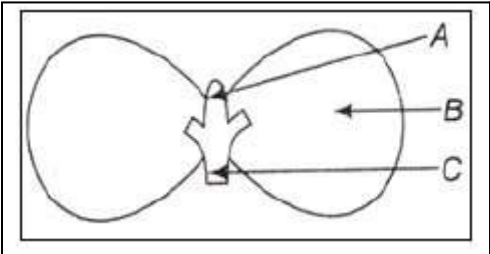
**Time Duration: 3 hours**

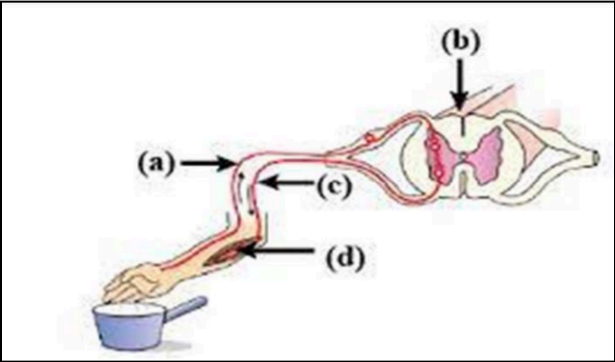
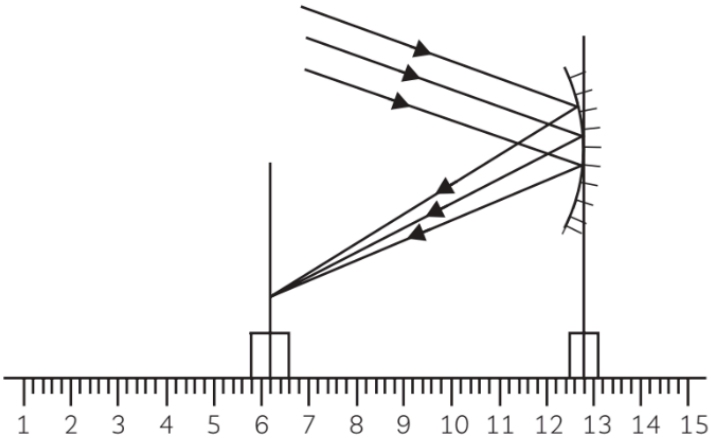
**M.M. 80**

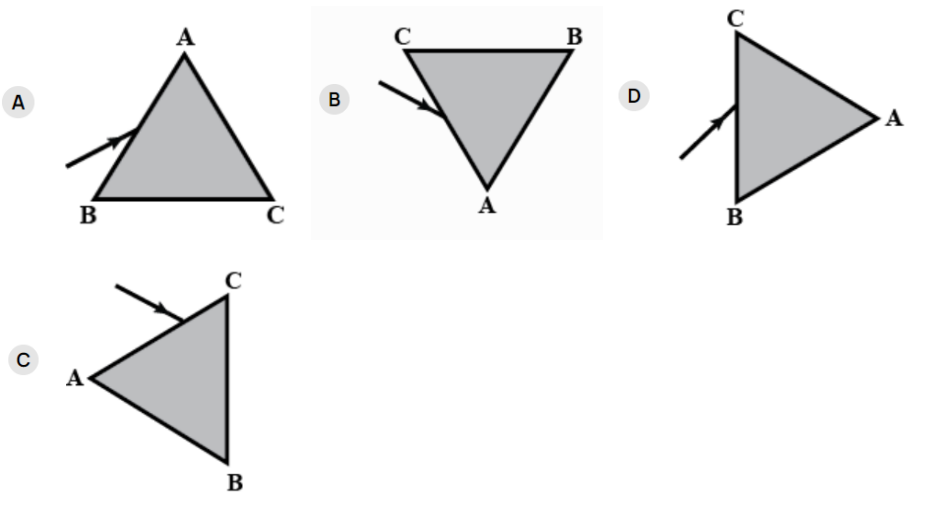
- 1. This question paper consists of 39 questions in 5 sections.**
- 2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.**
- 3. Section A would have 16 MCQs and 04 Assertion-Reasoning type questions carrying 1 mark each.**
- 4. Section B would have 6 Very Short Answer type questions carrying 02 marks each.**
- 5. Section C would have 7 Short Answer type questions carrying 03 marks each.**
- 6. Section D would have 3 Long Answer type questions carrying 05 marks each.**
- 7. Section E would have 3 source based/case based/passage based/integrated units of assessment (04 marks each) with sub-parts of the values of 1/2/3 marks.**

<b>Q.No.</b>		<b>Marks per Q</b>
<b>SECTION A</b> <b>Question 1 to 16 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.</b>		
<b>1</b>	Name the products formed when iron filings are heated with dilute hydrochloric acid (a) Fe (III) chloride and water (b) Fe (II) chloride and water (c) Fe (II) chloride and hydrogen gas (d) Fe (III) chloride and hydrogen gas	<b>1</b>
<b>2</b>	Which option gives the process of extraction of mercury from its ore cinnabar? a) cooling cinnabar in the presence of excess air b) cooling cinnabar to convert it into mercuric oxide and then heating it c) heating cinnabar to convert it into mercuric oxide and then heating it again d) heating cinnabar in the presence of limited air to and then adding a small amount of water	<b>1</b>
<b>3</b>	Juice of tamarind turns blue litmus to red. It is because of the presence of an acid called: (a) methanoic acid	<b>1</b>

	(b) acetic acid (c) tartaric acid (d) oxalic acid	
<b>4</b>	When 2 mL of sodium hydroxide solution is added to few pieces of granulated zinc in a test tube and then warmed, the reaction that occurs can be written in the form of a balanced chemical equation as: (a) $\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2\text{O}$ (b) $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$ (c) $2\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2$ (d) $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2\text{O}$	<b>1</b>
<b>5</b>	Which of the following gases can be used for storage (a) Carbon dioxide or Oxygen (b) Nitrogen or Oxygen (c) Carbon dioxide or Helium (d) Helium or Nitrogen	<b>1</b>
<b>6</b>	Sodium hydroxide is termed an alkali while Ferric hydroxide is not because: a) Sodium hydroxide is a strong base, while Ferric hydroxide is a weak base. b) Sodium hydroxide is a base which is soluble in water while Ferric hydroxide is also a base but it is not soluble in water. c) Sodium hydroxide is a strong base, while Ferric hydroxide is a strong acid. d) Sodium hydroxide and Ferric hydroxide both are strong bases but the solubility of Sodium hydroxide in water is comparatively higher than that of Ferric hydroxide.	<b>1</b>
<b>7</b>	$\text{MnO}_2 + 4\text{HCl} \rightarrow 2\text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$ Identify the substance oxidized in the above equation. (a) $\text{MnCl}_2$ (b) $\text{HCl}$ (c) $\text{H}_2\text{O}$ (d) $\text{MnO}_2$	<b>1</b>
<b>8</b>	<b>Which of the following is a function of pancreatic juice?</b> (a) <b>Trypsin digests proteins and lipase digests carbohydrates.</b> (b) <b>Trypsin digests emulsified fats and lipase digests proteins.</b> (c) <b>Trypsin and lipase digest fats.</b> (d) <b>Trypsin digests proteins and lipase digests emulsified fats.</b>	<b>1</b>

<p>9</p>	<p>The image shows the circulation of blood in fish and humans. How is circulation of blood in fish different from that in humans?</p>  <p>(a) The heart in fish is bigger in size.  (b) The flow of blood through a fish's heart occurs twice.  (c) The blood goes through the heart only once in fishes.  (d) The heart of a fish has more chambers compared to that of a human.</p>	<p>1</p>
<p>10</p>	<p>Which of the following is not a role of decomposers in the ecosystem?</p> <p>a. Natural replenishment of soil.  b. Enrichment of oxygen in the atmosphere.  c. Waste decomposition.  d. Break-down of dead remains</p>	<p>1</p>
<p>11</p>	<p>In the below figure, parts A, B and C are, sequentially,</p>  <p>a) Cotyledon, plumule and radicle  b) Plumule, radicle and cotyledon  c) Plumule, cotyledon and radicle  d) Radicle, cotyledon and plumule</p>	<p>1</p>

<p>12</p>	<p>What is the first step in activation of the reflex arc?</p>  <p>a) Information processing  b) Activation of receptors  c) Activation of structure labeled a)  d) Activation of structure labeled c)</p>	<p>1</p>
<p>13</p>	<p>The focal length of the concave mirror in the following experimental set up is:</p>  <p>a. 6.6 cm  b. 6.8 cm  c. 12.8 cm  d. 6.2 cm</p>	<p>1</p>
<p>14</p>	<p>Based on the different orientations of a prism ABC (with BC as base) given below, in which of the following cases, after dispersion, the third colour from the top corresponds to the colour of sky?</p>	<p>1</p>

	 <p>a. A b. B c. C d. D</p>	
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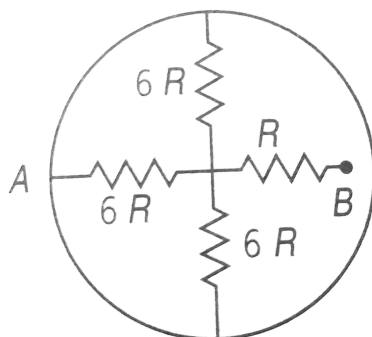
15	<p>Which one is a possible progeny in F<sub>2</sub> generation of purebred tall plant with round seed and short plant with wrinkled seeds?</p> <p>a. Tall plant with round seeds b. Tall plant with wrinkled seeds c. Short plant with round seed d. All of the above</p>	1
16	<p>In a given food chain the amount of energy at the fourth trophic level is 5 KJ, what will be the energy at producer level ?</p> <p>a. 5KJ      b. 50KJ      c. 500kJ      d. 5000KJ</p>	1

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

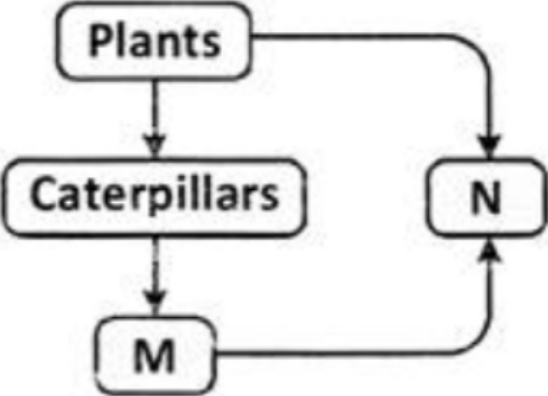
- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, and R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true

17	<p><b>Assertion (A) :</b> The balancing of chemical equations is based on the law of conservation of mass. <b>Reason (R) :</b> Total mass of reactants is equal to total mass of products.</p>	1
18	<p><b>Assertion (A):</b> Pyruvate is a six-carbon molecule. <b>Reason (R):</b> It is prepared in the cytoplasm as the first step of cellular</p>	1

	respiration.	
19	<p><b>Assertion :</b> When two long parallel wires, hanging freely are connected in series to a battery, they come closer to each other.</p> <p><b>Reason :</b> Wires carrying current in opposite direction repel each other</p>	1
20	<p><b>Assertion:</b> Aquarium needs regular cleaning</p> <p><b>Reason:</b> There are no microbes to clean water in aquarium, therefore, it needs to be regularly cleaned.</p>	1
<p><b>SECTION B</b></p> <p><b>Question No. 21 to 26 are very short answer questions</b></p>		
21	<p>Complete the missing components/variables given as x and y in the following reactions:</p> <p>(a) <math>\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{KI}(\text{aq}) \rightarrow \text{PbI}_2(\text{x}) + 2\text{KNO}_3(\text{y})</math></p> <p>(b) <math>\text{Cu}(\text{s}) + 2\text{AgNO}_3(\text{aq}) \rightarrow \text{Cu}(\text{NO}_3)_2(\text{aq}) + \text{x}(\text{s})</math></p>	2
22	<p>a) Explain the mechanism of inspiration in human beings.</p> <p>b) What is the significance of residual volume with respect to respiration ?</p>	2
23	<p><b><u>Attempt either option A or B</u></b></p> <p><b>A.</b> What will be the consequence of absence of decomposers in an ecosystem?</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.</b> a) Vegetarian food habit can sustain a larger number of people .Justify this statement in terms of the food chain .</p> <p>b) In a lake contaminated with pesticides, which one of the following organisms living in the lake will contain the maximum amount of pesticide?</p> <p>Small fish, zooplankton, big fish, phytoplankton.Explain why?</p>	2
24	<p>In the network shown in the figure, the ring has zero resistance. Find the resistance between A and B.</p>	2



25	<p><b><u>Attempt either option A or B</u></b></p> <p><b>A. How does a solenoid behave like a magnet? Can you determine the north and the south poles of a current-carrying solenoid with the help of a bar magnet? Explain</b></p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.</b>  <b>A compass needle is placed near a current-carrying wire. State your observation for the following cases, and give reason for the same in each case.</b></p> <p><b>(a) Magnitude of electric current in the wire is increased.</b>  <b>(b) The compass needle is displaced away from the wire.</b></p>	2
26	<p><b>Explain how the translocation of materials in phloem tissue in plants is achieved by utilising energy.</b></p>	2
<p><b>SECTION C</b></p> <p><b>Question No. 27 to 33 are short answer questions</b></p>		
27	<p>A compound which is prepared from gypsum has the property of hardening when water is mixed in right quantity with it:</p> <p>(i) Write common name and the chemical name of this compound.            (ii) Give chemical equation for its preparation.            (iii) List its two uses.</p>	3
28	<p><b><u>Attempt either option A or B</u></b></p> <p><b>A.</b></p> <p>(i) Suggest a safe procedure of diluting a strong concentrated acid.            (ii) Name the salt formed when sulphuric acid is added to sodium</p>	3

	<p>hydroxide and write its pH.          (iii) Dry HCl gas does not change the colour of dry blue litmus paper. Why?</p> <p style="text-align: center;"><b>OR</b></p> <p>B.          The electronic configurations of three elements X, Y and Z are X — 2, 6; Y — 2, 8 and Z — 2, 8, 2.          a) Out of X, Y and Z- which one is a metal? Justify your answer.          b) Which of the two elements will chemically combine to form an ionic compound? Show electron dot structure for the formation of the answered ionic compound.</p>	
<p><b>29</b></p>	<p>Answer the questions based on the figure given below:</p>  <p>a) To which trophic level is 'M' and 'N' assigned respectively ?          b) If energy available to M is 200J ,calculate the solar energy available in such an ecosystem.          c) What do the arrowheads in the figure represent? .</p>	<p><b>3</b></p>
<p><b>30</b></p>	<p>A cross was made between pure breeding pea plants, one with round and green seeds and the other with wrinkled and yellow seeds.          (a) Write the phenotype of F1 progeny. Give reason for your answer.          (b) Write the different types of F2 progeny obtained along with their ratio when F1 progeny was selfed.</p>	<p><b>3</b></p>
<p><b>31</b></p>	<p><b>An electric iron is used on a 240 V supply and draws a current of 4 Ampere.</b>  <b>(A) What is its power?</b></p>	<p><b>3</b></p>



	(B) What is its resistance? (C) What is the cost of using the iron for the month of January 10 hours a day if 1 KWH costs Rs 3.40?	
32	Give reasons: A. Concave mirrors are used as reflectors in headlights of cars. B. Convex mirrors are used as rear view mirrors. C. Dispersion does not take place in glass slab	3
33	A student fixes a sheet of white paper on a drawing board. He places a bar magnet in the centre of it. He sprinkles some iron filings uniformly around the bar magnet. Then he taps the board gently and observes that the iron filings arrange themselves in a particular pattern. (A) Why do the iron filings arrange in the given pattern? (B) What do the lines along which the iron filings align represent? (C) What does the crowding of iron filings at the end of the magnet indicate?	3
<b>SECTION D</b>		
Question No. 34 to 36 are long answer questions.		
34	<b><u>Attempt either option A or B</u></b>  A. i. Write the names of the following compounds.  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(a)</p> <math display="block">\begin{array}{ccccccc} &amp; \text{H} &amp; \text{H} &amp; \text{H} &amp; \text{H} &amp; \text{O} &amp; \\ &amp;   &amp;   &amp;   &amp;   &amp;    &amp; \\ \text{H} &amp; - \text{C} &amp; - \text{C} &amp; - \text{C} &amp; - \text{C} &amp; - \text{C} &amp; - \text{OH} \\ &amp;   &amp;   &amp;   &amp;   &amp; &amp; \\ &amp; \text{H} &amp; \text{H} &amp; \text{H} &amp; \text{H} &amp; &amp; \end{array}</math> </div> <div style="text-align: center;"> <p>(b)</p> <math display="block">\begin{array}{ccccccc} &amp; \text{H} &amp; \text{H} &amp; &amp; &amp; &amp; \\ &amp;   &amp;   &amp; &amp; &amp; &amp; \\ \text{H} &amp; - \text{C} &amp; - \text{C} &amp; - \text{C} &amp; \equiv \text{C} &amp; - \text{H} &amp; \\ &amp;   &amp;   &amp; &amp; &amp; &amp; \\ &amp; \text{H} &amp; \text{H} &amp; &amp; &amp; &amp; \end{array}</math> </div> </div> ii. . A compound X is formed by the reaction of carboxylic acid C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> and alcohol in the presence of a few drops of H <sub>2</sub> SO <sub>4</sub> . The alcohol on oxidation with alkaline KMnO <sub>4</sub> followed by acidification gives the same carboxylic acid as used in this reaction. Give the names and structures of (a) carboxylic acid, (b) alcohol and (c) compound X OR  B. i. Why are detergents better cleansing agents than soaps? Explain. ii. Name the functional groups present in the following compounds (a ) CH <sub>3</sub> COCH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub> (b ) CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH  iii. Intake of a small quantity of methanol can be lethal. Comment.	5
35	<b><u>Attempt either option A or B</u></b>  A (i). What are sexually transmitted diseases? List two examples each	5

	<p>of diseases caused due to            (a) bacterial infection and (b) viral infection. Which device or devices may be used to prevent the spread of such diseases?            (ii) If a woman is using Copper-T, will it help in protecting her from sexually transmitted diseases? Why?            (iii) State one genetically different feature between sperms and eggs of humans</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.(i)</b> Draw a diagram of human female reproductive system and label the parts:            (a) which produce an egg            (b) where fertilisation takes place            (ii) Explain how the developing embryo gets nourishment inside the mother's body.            (iii) What happens to the egg when it is not fertilised?</p>	
<b>36</b>	<p><b><u>Attempt either option A or B</u></b></p> <p><b>A.</b> What is myopia? What are its causes? Draw ray diagrams relevant in correction of a myopic eye.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.</b>            i) Give reasons:            a. Stars show twinkling effect but planets don't            b. There is an advanced sunrise and a delayed sunset.            c. Danger signals are painted red in colour.            ii) The near point of a person has shifted to 50 cm from 25 cm. Calculate the power of the lens required to correct the defect.</p>	<b>5</b>
<p><b>SECTION E</b>  <b>Question No. 37 to 39 are case-based/data -based questions.</b></p>		
<b>37</b>	<p><b><u>Attempt either subpart D or E.</u></b>            Ores mined from the earth are usually contaminated with large amounts of impurities such as soil, sand, etc., called gangue. The impurities must be removed from the ore prior to the extraction of the metal. The processes Several steps are involved in the extraction of pure metal from ores. Metals and Nonmetals Used for removing the gangue from the ore are based on the differences between the physical or chemical</p>	<b>4</b>

	<p>properties of the gangue and the ore. Different separation techniques are accordingly employed.</p> <p>A. What are the process for the extraction of metals of low reactivity series?</p> <p>B. What is meant by Roasting?</p> <p>C. Give one example of extracting metals low in the activity series.</p> <p>D. What is another name for HgS, an ore of mercury?</p> <p style="text-align: center;"><b>OR</b></p> <p>E In which form do metals of low activity series occur in the earth crust?</p>											
<p><b>38</b></p>	<p><b>The human brain is a 3-pound (1.4-kilogram) mass of jelly-like fats and tissues—yet it's the most complex of all known living structures. The human brain is more complex than any other known structure in the universe. Weighing in at three pounds, on average, this spongy mass of fat and protein is made up of two overarching types of cells—called glia and neurons— and it contains many billions of each. Different types of glial cells provide physical protection to neurons and help keep them, and the brain, healthy. Neurons are notable for their branch-like projections called axons and dendrites, which gather and transmit electrochemical signals. This complex network of cells gives rise to every aspect of our shared humanity. We could not breathe, play, love, or remember without the brain.</b></p> <p><b><u>Attempt either subpart A or B.</u></b></p> <p><b>A.How are electrochemical signals transported from one neuron to the other ?</b></p> <p style="text-align: center;"><b>OR</b></p> <p><b>B. Draw a well labelled diagram of a neuron.</b></p> <p><b>C. Which part of the brain is associated with</b></p> <p><b>i) Maintaining the posture of body</b></p> <p><b>ii) Interpretation of sensory information</b></p> <p><b>D.Mention the function of glia cells present in the brain .</b></p>	<p><b>4</b></p>										
<p><b>39</b></p>	<p>Analyse the following table showing refractive indices of four media A, B, C and D and answer the questions that follow: The refractive indices of four media A, B, C and D are given in the following table:</p> <table border="1"> <thead> <tr> <th>Medium</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>Refractive Index</td> <td>1.33</td> <td>1.50</td> <td>1.52</td> <td>2.40</td> </tr> </tbody> </table> <p><b>A.If light travels from one medium to another, in which case the change in speed will be minimal.</b></p>	Medium	A	B	C	D	Refractive Index	1.33	1.50	1.52	2.40	<p><b>4</b></p>
Medium	A	B	C	D								
Refractive Index	1.33	1.50	1.52	2.40								

a. A to B

b. B to D

c. B to C

d. A to D

**B. If light travels from one medium to another, in which case the change in speed will be maximum.**

a. A to B

b. B to D

c. B to C

d. A to D

**C. Calculate the speed of light in the medium D if speed of light in vacuum is  $3 \times 10^8$  m/s**

**OR**

**C. Calculate the refractive index of B wrt A**