

<b>CBSE X</b>	<b>MT EDUCARE LTD.</b>	<b>Set - B</b>
	SUBJECT : <b>SCIENCE</b>	Marks : 80
Date :	<b>QUEST - II (Semi Prelim II)</b>	Time : 3 hrs.
	<b>MODEL ANSWER PAPER</b>	

<b>SECTION - A</b>		
1.	Paper industries, bamboo, bidi and tendu leaves industries.	<b>1</b>
2.	A recognisable feature of a human being (or any other organism) like height, complexion, colour of hair, colour of eye etc., are called 'traits' or 'characters'.	<b>1</b>
3.	(i) Pure ethanoic acid has a low freezing point and in cold countries freezes and looks like glaciers.	<b>1</b>
	(ii) Ethanol mixed with water freezes at temperatures lower than water. Thus a mixture of water and ethanol is used in radiators of cars in cold countries.	<b>1</b>
4.	(a) (i) Convex lens - Since the power is positive	<b>1</b>
	(ii) Concave lens - Since the power is negative.	<b>1</b>
(b)	$P = \frac{1}{f(m)}$ $f = \frac{1}{P}$ $f = \frac{1}{4D} = -0.25 \text{ m} = -25 \text{ cm}$ $u = -100 \text{ cm}$ $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $= -\frac{1}{25} - \frac{1}{100} = \frac{-5}{100}$ $= -\frac{1}{20}$ $= -20 \text{ cm}$	<b>1</b>

5. Image distance,  $v = -2 \text{ m}$ ,  $u = \infty$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$= \frac{1}{-2} - \frac{1}{\infty}$$

$$\frac{1}{f} = \frac{1}{-2}$$

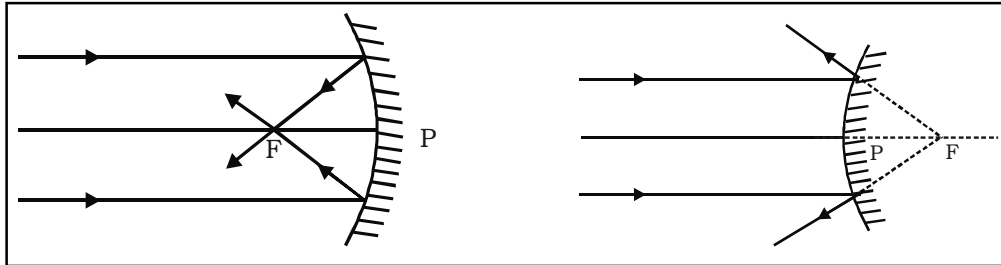
$$\therefore f = -2 \text{ m}$$

Power of Lens,

$$P = \frac{1}{-2} = -0.5 \text{ D}$$

2

6. (i) The path of rays is as shown in figures below :



(ii) This point is called the principal focus F of the concave mirror or convex mirror.

3

OR

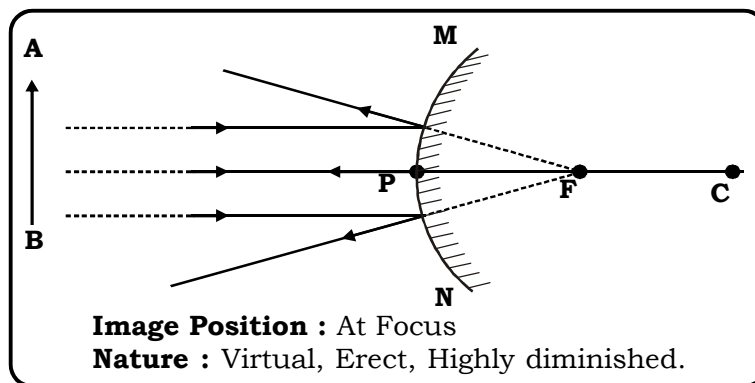
6. (a) The mirror is convex mirror.

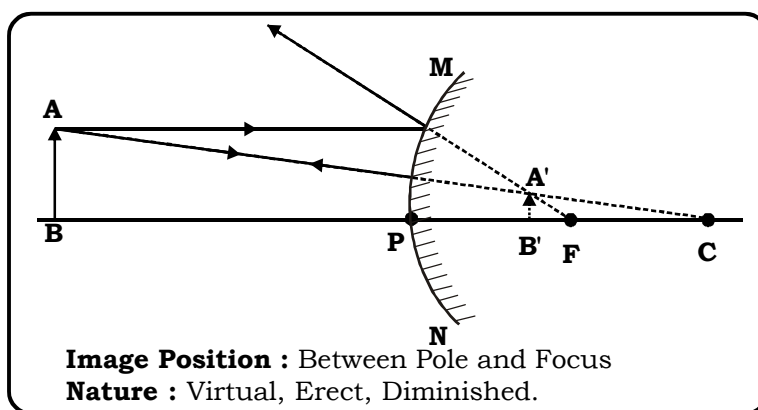
Ray diagram for formation of images by a convex mirror

1/2

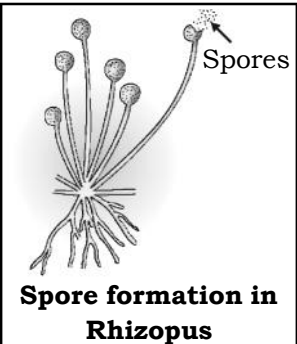
2

(b)

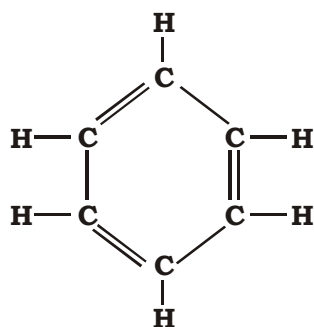
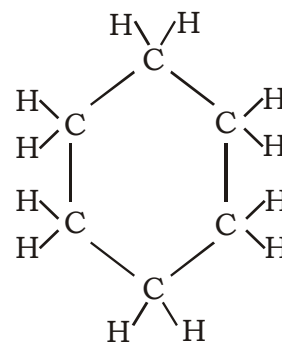




(c) We generally use convex mirror as rear view mirrors in vehicles to have a wider field of view.		½
7. (a) For a normal eye, the near point is at 25 cm and the far point is at infinity. The given person cannot see object clearly either closer to the eye or far away from the eye. So, he is suffering from both myopia and hypermetropia. (b) A bifocal lens consisting of a concave lens and convex lens of suitable focal lengths will be required to correct the defects and to increase his range of vision from 25 cm to infinity. In a bifocal lens the upper half of the lens is concave which corrects distant vision and the lower half is convex which corrects near vision.		<b>3</b>
8. (i) Acetone or propanone (ii) Butanoic acid (iii) 1-pentene		<b>1</b> <b>1</b> <b>1</b>
9. (i) $M_2O$ . This is because 1st group elements have valency of +1 and oxygen has valency of -2. (ii) $MCl_3$ . The elements of group 13 have valency of +3 and chlorine has valency of -1. (iii) $MX$ . This is because elements of group II have valency +2 and group 16 elements have valency of -2.		<b>1</b> <b>1</b> <b>1</b>

10.	<p>Spore formation in Rhizopus : This is an asexual method of reproduction in bacteria and fungi. Spores are unicellular bodies formed by cell division in a parent organism. After detaching from the parent, and if conditions are suitable, they germinate, directly or indirectly and develop into a new individual.</p>	 <p style="text-align: center; margin: 0;"><b>Spore formation in Rhizopus</b></p>	<b>3</b>			
<b>OR</b>						
10.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; padding: 5px; text-align: center;"><b>Pollination</b></th> <th style="width: 50%; padding: 5px; text-align: center;"><b>Fertilisation</b></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> <ol style="list-style-type: none"> <li>1. It is the process of transfer of pollen grains from anther to stigma of the same flower or of different flower.</li> <li>2. It requires pollinating agents like wind, water or animals.</li> <li>3. This process is followed by the fertilisation process.</li> </ol> </td> <td style="padding: 5px;"> <ol style="list-style-type: none"> <li>1. It is the fusion of male gamete with female gamete.</li> <li>2. It does not require any agent.</li> <li>3. This process is followed by embryo development.</li> </ol> </td> </tr> </tbody> </table>	<b>Pollination</b>	<b>Fertilisation</b>	<ol style="list-style-type: none"> <li>1. It is the process of transfer of pollen grains from anther to stigma of the same flower or of different flower.</li> <li>2. It requires pollinating agents like wind, water or animals.</li> <li>3. This process is followed by the fertilisation process.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is the fusion of male gamete with female gamete.</li> <li>2. It does not require any agent.</li> <li>3. This process is followed by embryo development.</li> </ol>	<b>3</b>
<b>Pollination</b>	<b>Fertilisation</b>					
<ol style="list-style-type: none"> <li>1. It is the process of transfer of pollen grains from anther to stigma of the same flower or of different flower.</li> <li>2. It requires pollinating agents like wind, water or animals.</li> <li>3. This process is followed by the fertilisation process.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is the fusion of male gamete with female gamete.</li> <li>2. It does not require any agent.</li> <li>3. This process is followed by embryo development.</li> </ol>					
11.	<p>There are various kinds of fossils.</p> <p>(a) <b>Fossil of ammonite</b> Ammonites are invertebrate animals (molluscs) with a flat coiled, spiral shell. They were in the sea about 180 million years ago.</p> <p>(b) <b>Fossil of trilobite.</b> Trilobites were marine arthropods. These were common between 400-600 million years ago.</p> <p>(c) <b>Fossil of Dinosaur.</b> They first appeared on earth about 250 million years ago and became extinct about 65 million years ago.</p>	<b>3</b>				
12.	<p>(a) Ice, crown glass, Rock salt, dense flint glass.</p> <p>(b) Refractive index = <math>\frac{\sin i}{\sin r} = \frac{\sin 45}{\sin 30} = \frac{1}{\frac{1}{2}} = \sqrt{2} = 1.41</math></p>	<b>2</b>				

13.

**Benzene****Cyclohexane**

Cyclohexane is a saturated hydrocarbon.

**3****OR**

13. Metalloids are element which resembles the properties of both metals and non-metals. The valence shell of metalloids contain 3, 4, 5, 6 electrons starting from periods 2 to 5 respectively. These form amphoteric oxides.

**3**

14. (i) Reusing is even better than recycling because the process of recycling uses some energy. In the 'reuse' strategy, you simply use things again and again, without using any energy for generating something new.
- (ii) (a) Clearing of forest land for agriculture.  
 (b) Building of roads through forests.  
 (c) Falling of large number of trees for furniture.

**3**

15. The organs which are similar in origin, similar in structure but dissimilar in function are called homologous organs.

Example :

The forelimbs of a man, a lizard, a frog, a bird and bat seem to be built from the same basic structure of bones but they perform different functions. It indicates that all these organisms have evolved from a common ancestor.

The organs which are dissimilar in origin, dissimilar in structure but similar in functions are called analogous organs.

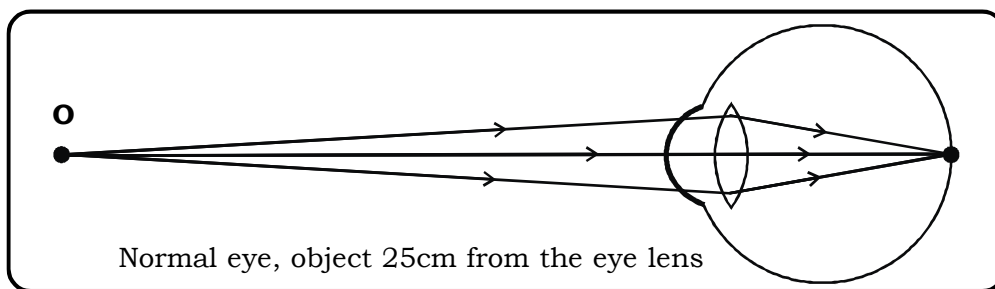
Example :

The wings of an insect and a bird have different structures but they perform the same function of flying.

**3**

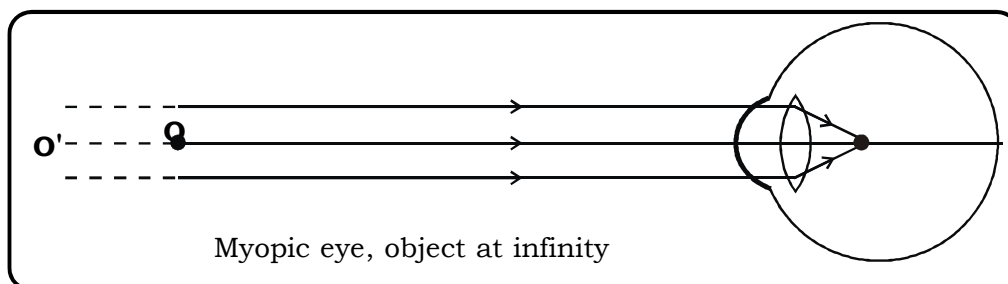
16.

(i)



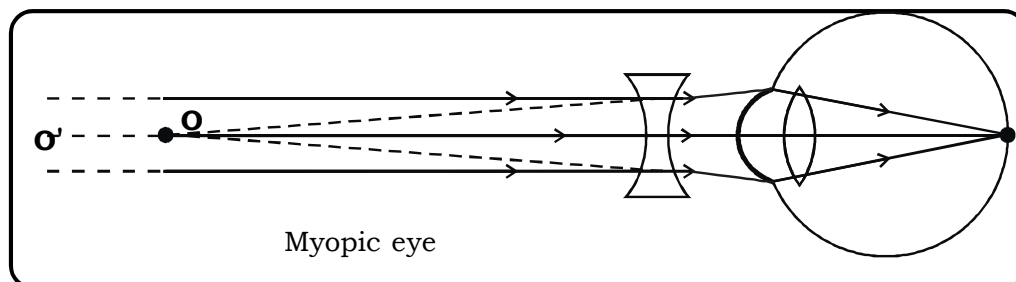
1

(ii)



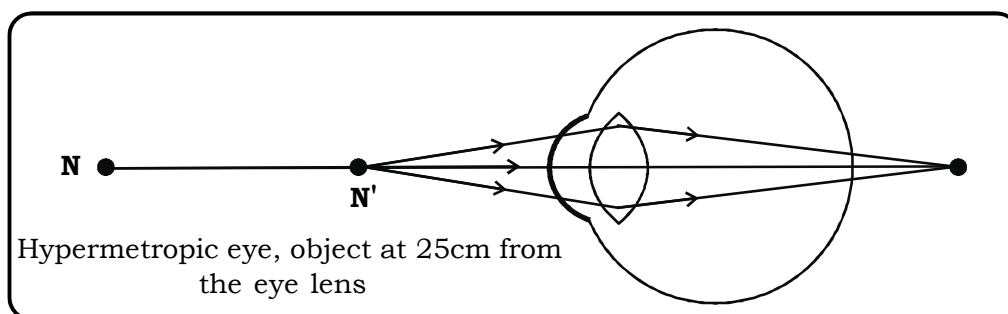
1

(iii)

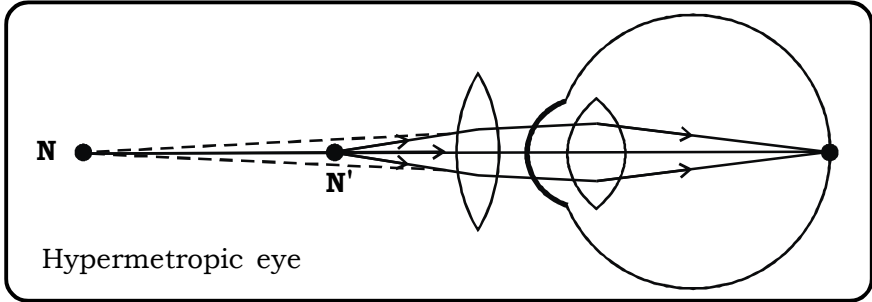


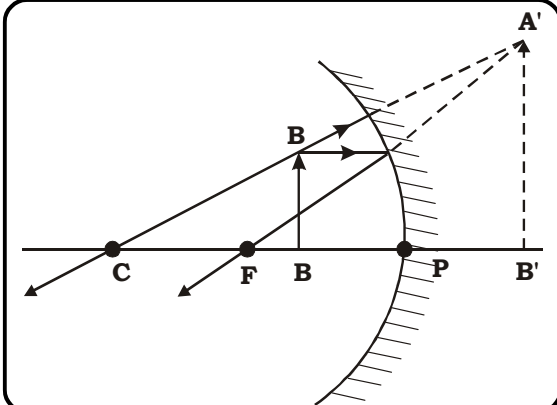
1

(iv)



1

	<p>(v)</p>  <p>Hypermetropic eye</p>	1
17.	<p>(A) Esters are sweet smelling substances. These are used in making perfumes and as flavouring agents. Esters are obtained when an alcohol is warmed with a carboxylic acid in the presence of conc. sulphuric acid. This is called esterification.</p> $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{Heat}]{\text{Conc. H}_2\text{SO}_4} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ <p style="text-align: center;">Acetic Acid      Ethyl alcohol                      Ethyl acetate</p>	3
	<p>(B) A 5–8% solution of acetic acid in water is called vinegar. It is used as preservative in pickles.</p>	2
	<p><b>OR</b></p>	
17.	<p>(A) Electronic configuration of nitrogen : 2, 5 Electronic configuration of phosphorus : 2, 8, 5 Nitrogen will be more electronegative because outermost shell is nearer to nucleus and thus nucleus will attract electrons more strongly.</p> <p>(B) The electronic configuration of A and B are 2, 8, 7 and 2, 8, 8, 1 respectively.</p> <p>(i) Element A has seven valence electrons and three shells, so it is placed in group 17 and 3<sup>rd</sup> period. Element B has one valence electron and four shells, so it is placed in group 1 and 4<sup>th</sup> period.</p> <p>(ii) A will have valency of –1 and B has valency of + 1, so its compound is AB.</p>	3
18.	<p><b>Advantages of dams:</b></p> <p>(i) The water stored in the dams is used for irrigation by constructing canals which carry water to the fields. The Indira Gandhi Canal carries water from Bhakra dam Punjab to villages in Rajasthan desert where it has brought greenery and added life to the soil.</p> <p>(ii) The water in dams is continuously available for the people in the vicinity to make use of it after purification.</p>	2

	<p>(iii) The water of the dam is also used in producing electricity. The water in the dam that falls from a certain height gains kinetic energy and rotates turbines to generate electricity. Hence this way it makes hydroelectricity.</p> <p><b>Disadvantages of dams:</b></p> <p>(i) <b>Social Problems:</b> Due to dam's construction, large number of human settlements are submerged in water and many people become homeless. The government must provide adequate compensation for the rehabilitation of these people which is not being done.</p> <p>(ii) <b>Ecological problems:</b> Lot of deforestation takes place for the construction of dams, which leads to loss of biodiversity. Many plants get submerged under water and on decomposition this releases methane gas; that is the greenhouse gas; causing global warming.</p> <p>(iii) <b>Economic problems:</b> For the construction of dams large funds are required, the government invests lot of money in its construction and the benefits of the output is not equivalent.</p>	5
19.	<p>(a) (i) The mirror will form an image of same size as that of object in part 3.</p>	1
	<p>(ii) In part 2, mirror can be used as a make-up mirror.</p>	1
	<p>(iii) </p>	2
	<p>(b) The mirror is plane mirror.</p>	1
20.	<p>(i) Electronic configuration of Ca = 2, 8, 8, 2.</p>	1
	<p>(ii) Valence electrons in Rb = one (2, 8, 18, 8, 1)</p>	1
	<p>(iii) Number of shells in Sr = 5(2, 8, 18, 8, 2)</p>	1
	<p>(iv) K is metal (2, 8, 8, 1)</p>	1
	<p>(v) Rubidium is largest in size.</p>	1
21.	<p>The Theory of Evolution proposed by Darwin is known as 'The Theory of Natural Selection'.</p>	



	<p>The important deductions of Darwin's theory are :</p> <p>(a) Within any population, there is natural variation.</p> <p>(b) Even though all species produce a large number of offsprings, populations remain constant.</p> <p>(c) This is due to the struggle between members of the same species and different species for food, space and mate.</p> <p>(d) The struggle for survival within populations eliminates the unfit individuals and fit individuals survive and reproduce. This is called natural selection or survival of fittest.</p> <p>(e) The individuals having favourable variations pass on these variations to their progeny from generation to generation.</p> <p>(f) These variations when accumulated over a long period of time, lead to the origin of a new species.</p> <p style="text-align: center;"><b>OR</b></p> <p>21. Contraception is the method to avoid pregnancy. Various methods of contraception are as follows :</p> <p><b>Physical Barrier Methods :</b></p> <p>Use of condoms, diaphragms, cervical caps can be used. These prevent the entry of sperms into the female genital tract by acting as a barrier between them.</p> <p><b>Chemical Methods :</b></p> <p>Oral pills can be used which change the hormonal balance and stop release of egg. Vaginal pills kill the sperms.</p> <p><b>Surgical Methods :</b></p> <p>These include <b>vasectomy</b> (removal of small portion of sperm duct) in males and <b>tubectomy</b> (removal of small portion of fallopian tube) in females.</p> <p><b>Intrauterine Contraceptive Devices (IUCDs) :</b></p> <p>A copper-T is placed safely in the uterus by a doctor or a skilled nurse that prevents implantation in the uterus.</p> <p style="text-align: center;"><b>SECTION - B</b></p> <p>22. Dirt is generally absorbed in the clothes as an oily material. It cannot be removed with water because it does not mix well with water. But when a cloth with dirt is soaked in soap solution, the dirt and grease attach themselves to the hydrocarbon component (e.g., <math>C_{15}H_{13}-</math>) of the soap molecule. The <math>-COONa</math> part of the soap which is attached to the water molecules pulls the hydrocarbon part along with dirt away from the surface of the cloth, thus washing it clean.</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">5</p> <p style="text-align: center;">2</p>
--	--	--

23.	<p>The simplest ketone is dimethyl ketone or acetone. The structural formula of acetone is</p> $  \begin{array}{c}  \text{H} \quad \text{O} \quad \text{H} \\    \quad    \quad   \\  \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\    \quad \quad   \\  \text{H} \quad \quad \text{H}  \end{array}  $ <p>It contains total of 3 C-atoms and it is the derivative of propane. Since it is a ketone, the suffix -e is replaced by the suffix -one. Therefore, IUPAC name is propanone.</p>	2
24.	<p>(i) Black is dominant while white is recessive.  (ii) Monohybrid cross ( as only one character is discussed ).  Phenotypic ratio is = 3 : 1</p>	1 1
25.	<p>(i) A judicious use of non-renewable energy resources so as to prevent its depletion.  (ii) Increasing use of renewable energy sources but not beyond its renewability. Stress should be laid on exploitation of inexhaustible sources of energy like solar energy.</p>	1 1
26.	<p>(i) Due to refraction of light, the rays converge at point A.  (ii) X is convex lens.  (iii) Point A is the focus of the lens because light rays converge at that point after passing through the lens  (iv) Power : Distance between the device and point A is focal length.  Reciprocal of focal length gives power.</p>	1 1 1 1
<b>OR</b>		
26.	<p>(A)  (a) Yes, it is possible when the refractive index of the medium is greater than the refractive index of the material of the lens.  (b) Given, <math>{}_g \eta_d = 1.6</math>, <math>{}_v \eta_g = 1.5</math>, <math>{}_v \eta_d = ?</math></p> <p>As, <math>{}_g \eta_d = \frac{{}_v \eta_d}{{}_v \eta_g}</math></p> $  \eta_d = {}_g \eta_d \times \eta_g = 1.6 \times 1.5 = 2.4  $ <p>(B) (i) The image is formed behind the retina, defect of the eye is hypermetropia.</p>	1 1

	(ii) Causes of hypermetropia : (i) the focal length of the eyelens is larger. (ii) the eyeball becomes too short, so that light rays from the nearby object, say at point N, cannot be brought to focus on the retina to give a distinct image. (iii) Hypermetropia can be corrected by using convex lens of suitable focal length in spectacles.	1 1 1
27.	(i) (a) Since refractive index for red colour is less, it has more speed in glass. (b) Both of them travel with the same speed in vacuum.	1 1
◆◆◆◆◆		