



# COMMON PRE-BOARD EXAMINATION 2022-23

Subject: SCIENCE (086)

Class X

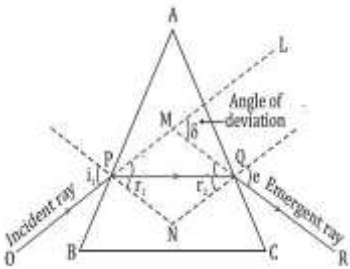


Max. Marks: 80

Time Allowed: 3 hours

## ANSWER KEY

SECTION - A		
1.	(b) Calcium carbonate	1
2.	(c) Carbon is getting oxidized.	1
3.	(d) Brown fumes of nitrogen dioxide is evolved	1
4.	(a) $\text{NaHCO}_3$ $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ $\text{CaOCl}_2$ $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$	1
5.	(c) Copper gets deposited on zinc as a reddish- brown mass and colour of the solution changes from blue to colourless	1
6.	(a) pH of pure water is 7, so it is basic in nature.	1
7.	(a) Both A and B	1
8.	(a) Plants absorb $\text{CO}_2$ from air and $\text{H}_2\text{O}$ from the soil as raw material and convert them into glucose.	1
9.	(d) Nostrils $\rightarrow$ pharynx $\rightarrow$ larynx $\rightarrow$ trachea $\rightarrow$ alveoli	1
10.	(c) Girl	1
11.	(b) It regulates growth and development of the body	1
12.	(d) Multiple fission	
13.	(d) $R_2 > R_1 > R_3$	1
14.	(b) normally out of the plane of the paper	1
15.	(a) 5 A	1
16.	(d) None of these	1
17.	(a) Both A and R are true and R is the correct explanation of A	1
18.	(c) A is true but R is false	1
19.	(b) Both A and R are true and R is not the correct explanation of A	1
20.	(d) A is False but R is True	1
<b>SECTION – B</b>		
<b>Q. no. 21 to 26 are very short answer questions</b>		
21.	This is a double displacement reaction -1 mark $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow 2\text{NaCl} + \text{BaSO}_4$ -1mark OR (a) $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$ - 1mark.	2

	(b) $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{H}_2$ -1mark	
22.	(a) The growth of a pollen tube towards the ovule -1Mark (b) The growth of plant roots - 1 Mark *Alternatively accept the relevant examples for a and b	2
23.	Hawks will get more energy in B ½Mark A case 0.1J and B case 1J ½ +½ Marks According to 10% law, only 10% of energy is transferred from one trophic level to another ½Mark	2
24.	(a) Forebrain ½Mark (b) Protects the brain ½Mark (c) Medulla ½Mark (d) Cerebellum ½Mark	2
25.	(a) <div style="text-align: center;">  <p>(1)</p> </div> <p>(b) Dispersion (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) The relation between colour of scattered light and size of the scattering particle is, small size particles scatter the light of a shorter wavelength (violet and blue), and large-sized particles scatter a longer wavelength (red and orange). However, if the particle size is too large then the scattered light will appear white. (3 x 1/2 = 1½)</p> <p>(b) The apparent position of an object, when seen through the hot air, fluctuates or wavers. The basic cause of this observation is the refraction of light through variation in the physical condition of hot air. (1/2)</p>	2
26.	a. Tt 1 mark b. Traits like 'T' are called dominant traits, while those that behave like 't' are called recessive traits. /Alternatively accept the definition of dominant and recessive traits with examples of T and t respectively /Alternatively accept the law of Dominance with examples of T and t. 1mark	2
<b>SECTION - C</b>		
<b>Q.no. 27 to 33 are short answer questions.</b>		

27.	<div style="text-align: center;"> <math display="block">\begin{array}{ccc} \text{Mg} &amp; \longrightarrow &amp; \text{Mg}^{2+} + 2\text{e}^{-} \\ 2,8,2 &amp; &amp; 2,8 \\ &amp; &amp; \text{(Magnesium cation)} \end{array}</math> <math display="block">\begin{array}{ccc} \text{Cl} &amp; + \text{e}^{-} &amp; \longrightarrow &amp; \text{Cl}^{-} \\ 2,8,7 &amp; &amp; &amp; 2,8,8 \\ &amp; &amp; &amp; \text{(Chloride anion)} \end{array}</math> </div> <p style="text-align: right;">- 2marks</p> <p><math>\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow 2\text{Fe} + \text{Al}_2\text{O}_3 + \text{Heat}</math> - 1 mark</p>	3
28.	<p>(a) When electricity is passed through an aqueous solution of sodium chloride (called brine), it decomposes to form sodium hydroxide.  <math>2\text{NaCl} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{Cl}_2 + \text{H}_2</math> (Equation-1 mark)</p> <p>(b) At cathode -Hydrogen gas-1/2 mark          At anode -Chlorine gas -1/2 mark</p> <p>(c) Water of crystallization is the amount of water molecules which are present in one formula unit of salt.-1 mark</p>	3
29.	<p>(a) <b>Transpiration</b> creates <b>water pressure/suction pressure</b> in the xylem. This pressure pulls the water via the stem to the leaves. Thus, water is transported faster through the xylem during the day. <span style="float: right;"><b>1 mark</b></span></p> <p>(b) herbivores consume plant and grass-based food which is high in <b>cellulose</b> and the digestion of cellulose takes a <b>long time</b>. <span style="float: right;"><b>1 mark</b></span></p> <p>(c) because the <b>amount of dissolved oxygen is fairly lower in water</b> than air. <b>1 mark</b>          { Consider if the sentence phrases are differently written }</p> <p style="text-align: center;"><b>OR</b></p> <p>A-Mouth          B-Oesophagus          C-Liver          D-Stomach          E-Pancreas          F-Large Intestine</p> <p style="text-align: right;"><b>(6 x 1/2 = 3)</b></p>	3
30.		3

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f} \quad (1/2)$$

Substituting the given values, we get-

$$\frac{1}{v} + \frac{1}{(-10)} = \frac{1}{(-15)} \quad \left| \quad \frac{1}{v} - \frac{1}{10} = -\frac{1}{15} \quad \frac{1}{v} = \frac{1}{10} - \frac{1}{15} \right.$$

$$\frac{1}{v} = \frac{3-2}{30} \quad \quad \quad v = +30\text{cm}$$

Thus, the position of the image,  $v$  is **30 cm** from the mirror.

The positive sign implies that the image is formed behind the mirror

As  $v$  is positive the nature of the image will be **virtual and erect**.

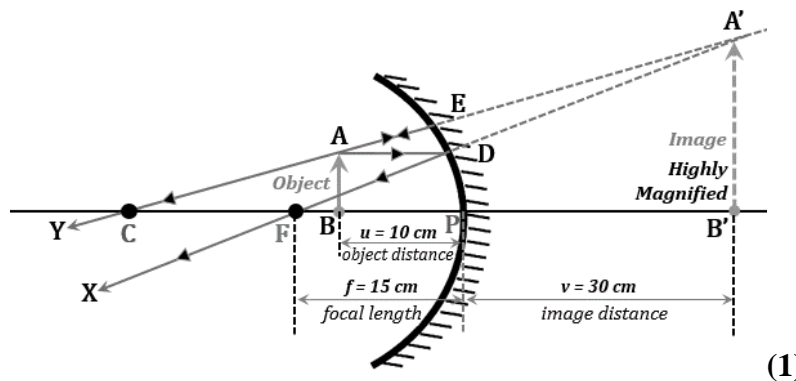
$$m = -\frac{v}{u} \quad m = -\frac{30}{-10} \quad \quad \quad m = +3$$

Thus, the magnification is **3**, which means that the image will be highly magnified in size.

**(a) Position of the image - 30cm behind the mirror. (1/2)**

**(b) Size of the image - highly magnified in size. (1/2)**

**(c) Nature of the image - virtual and erect. (1/2)**



(1)

31. (a) If a person is suffering from both myopia and hypermetropia.

(i) **Bifocal lenses** can correct this defect. (1/2)

(ii) These lenses are prepared by combining both the lenses in spectacles, such that its upper part of the spectacles consists of a concave lens (to correct myopia) and the lower part consists of a convex lens (to correct hypermetropia). (1)

**(b) Given:**

The power of lens is given as-

$$P=1/f \quad (1/2)$$

Substituting the given values

$$f_1=0.33\text{m} = +33.3\text{cm} \quad (1/2)$$

$$f_2 = -0.33\text{m} = -33.3\text{cm} \quad (1/2)$$

32. (a) Any two points to distinguish between AC and DC (2x 1/2)

(Magnitude, direction, level of danger,)

(b) Three characteristic features of the electric current used in our homes-

3

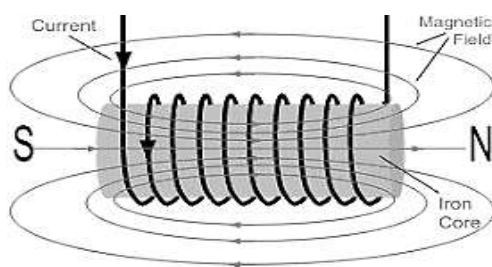
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- i. Reverses direction periodically. (1/2)
- ii. Frequency of 50 Hz. (1/2)
- iii. Potential difference between live wire and neutral wire is about 220V. (1/2)
- (c) It is necessary to earth metallic electric appliances because it provides a low resistance conducting path for the current and protects the user from electric shock due to leakage of current. (1/2)

**OR**

(a) It consists of a long coil of insulated copper wire wrapped around a soft iron core that gets magnetized only when the electric current is passed through the coil. (1/2)

electric bell, and electric motor., cranes (any one) (1/2)



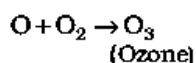
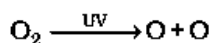
(1)

Two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed are as follows:

1. **Number of turns in the coil:** By increasing the number of turns in the coil, the strength of an electromagnet can be increased. (1/2)
2. **Current flowing through the coil:** By increasing the current flowing through the coil, the strength of an electromagnet can be increased. (1/2)

33. (a) Protect the Earth from sun's harmful UV radiations. **1Mark**

(b) The higher energy UV radiations split apart some molecular oxygen (O<sub>2</sub>) into free oxygen (O) atoms.  $\frac{1}{2}$  **mark**. These atoms then combine with the molecular oxygen to form ozone  $\frac{1}{2}$ **mark** / Below 2 equations carrying  $\frac{1}{2}$  **mark** each.



(c) Chlorofluorocarbons /(CFCs) **1 mark**

**3**

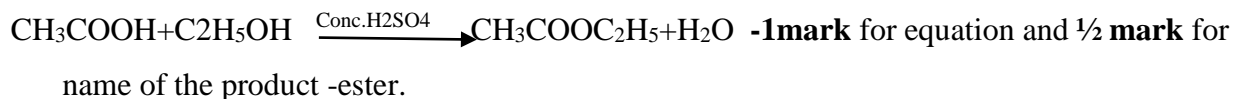
**SECTION - D**

**Q.no. 34 to 36 are Long answer questions.**

34. (a) X is ethanoic acid and the structure is CH<sub>3</sub> COOH -**1mark** for structure and  $\frac{1}{2}$  **mark** for identification.

**5**

(b) When ethanol reacts with ethanoic acid in the presence of a little of concentrated sulphuric acid, a sweet-smelling ester called ethyl ethanoate(ester) is formed



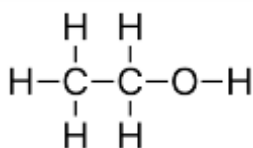
(c) When ester treated with an alkali, the reaction gives ethanol and sodium ethanoate. This reaction is called saponification-**1 mark**

This can be given by following equation.



**OR**

(a)



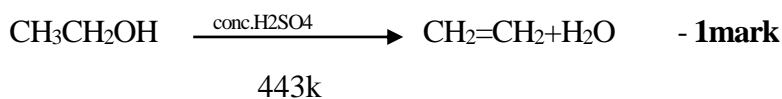
**1 mark**

Soluble in water in all proportions

Ethanol is a liquid at room temperature (any two physical properties) ( $\frac{1}{2} + \frac{1}{2}$  **mark**)

(b) Ethanol when heated at 433 k with excess conc.  $\text{H}_2\text{SO}_4$

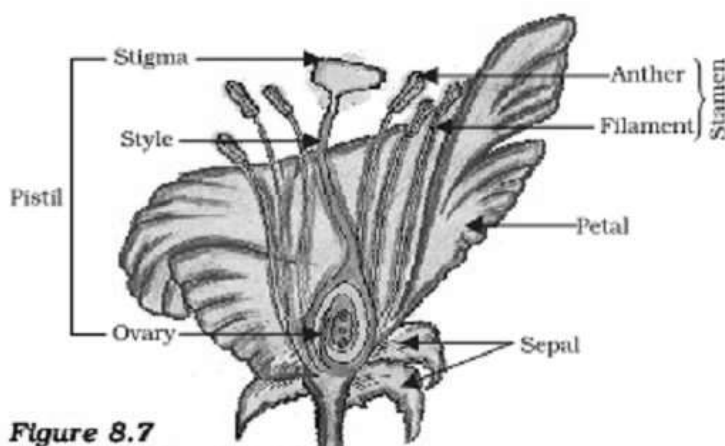
undergoes **dehydration** reaction to form ethene -**1 mark**



(d) The concentrated sulphuric acid can be regarded as a **dehydrating agent** which removes water from ethanol -**1 mark**

35

a)



**Figure 8.7**  
Longitudinal section of  
flower

Any Flower diagram to be considered-1 mark

Precise labelling of stamen -1 Mark

b) Any 2 relevant points of difference for each ----(4 x  $\frac{1}{2}$  = 2)

5

S. No.	Pollination	Fertilisation
1	Transfer of pollen grains from anther to stigma of the flower is called pollination.	Fusion of male gametes and egg cell in embryo sac situated inside the ovule is called fertilisation.
2	This process takes place before fertilisation.	This process takes place after pollination.
3	For the completion of this process, insects, water, air like agencies are essential.	There is no external medium is utilized in this process.
4	Pollen tube is not formed.	Pollen tube is formed which transfer male gametes up to egg cell.
5	This process takes place on the outer parts of flower, so that it is an external mechanism.	This process takes place inside the flower, so that it is internal mechanism.

- c) i) Cotyledons  $\frac{1}{2}$  mark      ii) Plumule  $\frac{1}{2}$  mark

**OR**

(a) Fallopian tube/oviduct ----- **1Mark**

(b) The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta **1Mark**

This provides a large surface area for glucose and oxygen to pass from the mother to the embryo.  **$\frac{1}{2}$  Mark**

The developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta.  **$\frac{1}{2}$  Mark**

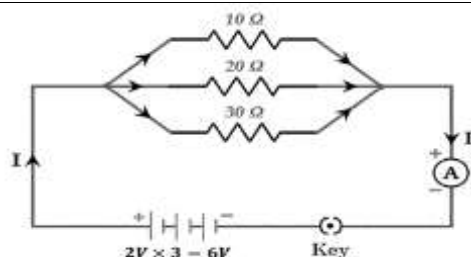
(c) Warts, HIV-AIDS, Gonorrhoea and syphilis-----ANY 2 diseases to be mentioned.

**$\frac{1}{2} + \frac{1}{2}$  mark**

(d) To prevent illegal sex-selective abortion of female fetuses/to maintain child sex ratio

**1Mark**

36.



**(1)**

voltage of each cell = 2 V, number of cells = 3, total voltage of the battery =  $3 \times 2 = 6$  V,  $R_1 = 10$  ohm,  $R_2 = 20$  ohm,  $R_3 = 30$  ohm

All the resistances are in parallel. So, the equivalent resistance is given by

**5**

	$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \quad (1/2)$ $\frac{1}{R} = \frac{1}{10} + \frac{1}{20} + \frac{1}{30}$ <p><math>R = 60 / 11 = 5.45 \text{ ohm}</math></p> <p>Total current, <math>i = V / R = 6 / 5.45 = 1.1 \text{ A}</math></p> <p>(a) Let the current is <math>i_1, i_2</math> and <math>i_3</math> in the resistance <math>R_1, R_2</math> and <math>R_3</math></p> <p>Voltage is same across each resistor in parallel combination.</p> <p><math>i_1 = V/R_1 = 6 / 10 = 0.6 \text{ A} \quad (1/2)</math></p> <p><math>i_2 = V / R_2 = 6 / 20 = 0.3 \text{ A} \quad (1/2)</math></p> <p><math>i_3 = V/R_3 = 6 / 30 = 0.2 \text{ A} \quad (1/2)</math></p> <p>(b) Total current, <math>i = 1.1 \text{ A} \quad (1)</math></p> <p>(c) Total effective resistance, <math>R = 5.45 \text{ Ohm} \quad (1)</math></p>	
<b>SECTION - E</b>		
37.	<p>(a) Metal oxides are treated with reactive metals /displacement reaction with reactive metals. - <b>1mark</b></p> <p>(b) Impure copper as anode and pure copper as cathode. <span style="float: right;"><b><math>\frac{1}{2} + \frac{1}{2}</math> Mark</b></span></p> <p>(c) <math>2\text{HgS} + 3\text{O}_2 \longrightarrow 2 \text{HgO(s)} + 2\text{SO}_2</math> <span style="float: right;"><b>1 Mark</b></span></p> <p style="padding-left: 40px;"><math>2\text{HgO} \longrightarrow 2\text{Hg} + \text{O}_2</math> <span style="float: right;"><b>1 Mark</b></span></p> <p style="text-align: center;"><b>OR</b></p> <p>(c) The sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as roasting. The carbonate ores are converted into oxides by heating strongly in limited air. This process is known as calcination. <span style="float: right;"><b>2 marks</b></span></p>	<b>4</b>
38.	<p>(a) Recessive Gene <b>e</b>    1    Dominant gene <b>E</b> <span style="float: right;"><b>1 +1 Marks</b></span></p> <p>(b) Brown eye colour <span style="float: right;"><b>1 Mark</b></span></p> <p>(c) <b>(ee)</b> <span style="float: right;"><b>1 Mark</b></span></p> <p style="text-align: center;"><b>OR</b></p> <p>(c) <b>Ee X ee</b> Cross to be worked out and show 50% Ee and 50% ee. <span style="float: right;"><b>1 Mark</b></span></p>	<b>4</b>
39.	<p>(i) Increases. <span style="float: right;"><b>(1)</b></span></p> <p>(ii) A to B <span style="float: right;"><b>(1)</b></span></p> <p>(iii) The refractive index <math>n = C/v</math></p> <p>From the question, it is given that the speed of the light in the air is <math>C = 3 * 10^8 \text{ m/s}</math></p> <p>The refractive index of the medium A is <math>n_A = 1.5</math></p>	<b>4</b>



that of medium B is  $n_B = 1.33$

The velocity of light in medium A is  $v = C/n_A = 3 * 10^8 / 1.5 = 2 * 10^8 \text{ m/s}$  (1)

The velocity of light in medium B is  $v = C/n_B = 3 * 10^8 / 1.33 = 2.2 * 10^8 \text{ m/s}$  (1)

[Give ½ mark if only the formula is correct]

**OR**

$n_3, n_2, n_1$  (1/2)

$v_1, v_2, v_3$  (1/2)

$c$  ( $3 \times 10^8 \text{ m/s}$ ) (1)

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