## SCIENCE WORKSHEET-I

1) The two laws of reflection are:—

a) Incident Ray, Reflected Ray, Normal Line all lie on the surface of reflection (coplaner) and meet at a single point called the point of incidence (concurrent).

b) The angle of incidence [Angle between the Incident Ray and the Normal Line] is equal to the angle of reflection [Angle between Reflected Ray and the Normal Line].

2)
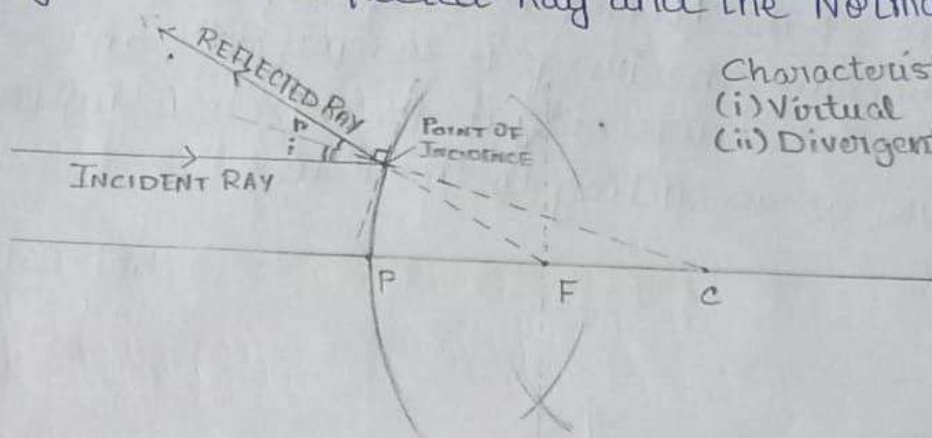
Characteristics:
(i) Virtual
(ii) Divergent.

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3) i) Refractive index of diamond, $n_1 = 2.42$. This statement says means that the speed of light in vacuum divided by the speed of light inside the diamond gives us this value i.e. called the refractive index of diamond. This also means that the no of times we need to multiply the speed of light inside the diamond with, to get the speed of light in vacuum is the refractive index of diamond. Light slows down by a factor of 2.42 (refractive index) when entering the diamond, is the inference.

ii) The speed of Light in vacuum = 3×10^8 ms^{-1} [$V_1 = 3 \times 10^8$ m/s]
refractive index of glass = 1.50 [$n_2 = 1.5$]

∴ $n_2 = \dfrac{V_1}{V_2}$, [V_2 is speed of Light in glass].

∴ $V_2 = \dfrac{V_1}{n_2} = \dfrac{\overset{2}{\cancel{3} \times 10^8}}{\cancel{1.5}} = 2 \times 10^8$ m/s [Ans]

4) magnification, $m = +3$

now, $m = \dfrac{h'}{h} \begin{cases} h' = \text{height of image} \\ h = \text{height of object} \end{cases}$

i) The mirror must be Concave Mirror.

Since, $h' = m \times h \Rightarrow h' = 3 \times h$.

The image is enlarged or magnified, which cannot occur in a convex mirror.

ii) The object must be nearer to the Pole, infront of the Focus of the Mirror as according to the Pole. This is because the image is magnified, and magnification occurs only if the objects is infront of the Focus, as according to the Pole.
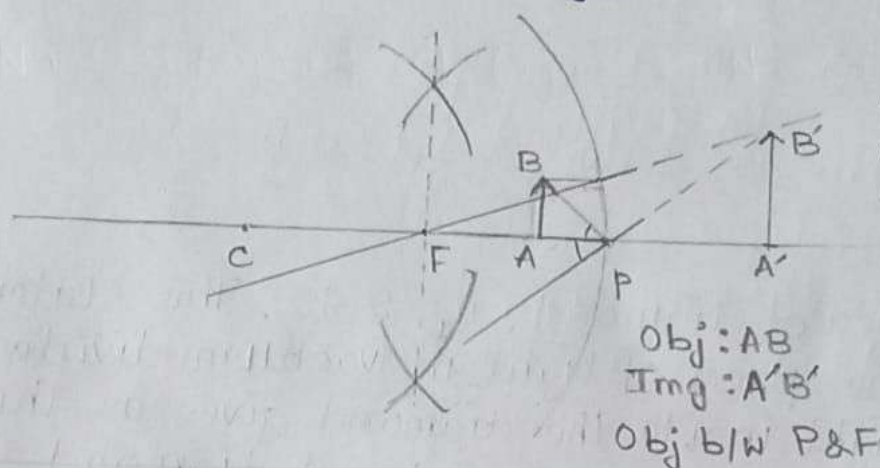
Characteristics:
(i) Virtual
(ii) Enlarged
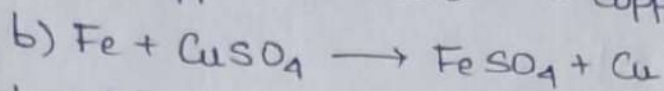(iii) Erect.

m

Obj : AB
Img : A'B'
Obj b/w P & F

5) A balanced Chemical Equation is a symbolic representation of a chemical ~~equation~~ reaction in which the number of atoms of each element is the same on both the rectant and the product sides of the equation.

We should balance a chemical equation because keeping the same no of atoms of each element on either side of the equation helps the equation follow the Law of the Conservation of Mass. Moreover, it is a more accurate representation of the reaction, which helps in predicting quantities and even perform chemical reactions with precision.
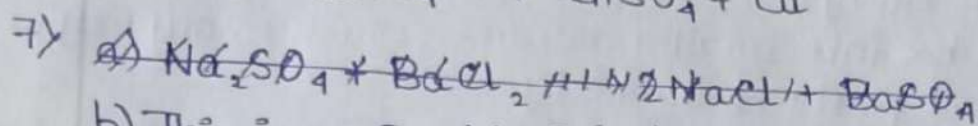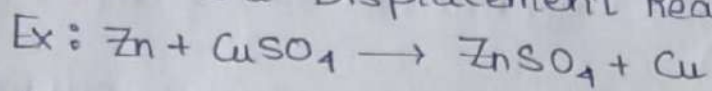
6) a) Calcium Carbonate $\xrightarrow{\Delta}$ Calcium Oxide + Carbondioxide
   ↳ This is a Thermal Decomposition Reaction
   Ex: Copper Carbonate $\xrightarrow{\Delta}$ Copper Oxide + Carbondioxide
   b) $Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$
   ↳ This is a Displacement Reaction
   Ex: $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$

7) ~~a) Na₂SO₄ + BaCl₂ + H + N2Nacl + BaSO₄~~
   b) This is a Double Displacement Reaction
   c) The Reaction is in aqauous state and $BaSO_4$ is insoluble in water and forms the white precipitate while $NaCl$ is soluble and stays in aquous state
   a) $Na_2SO_4 (aq) + BaCl_2 (aq) \longrightarrow 2NaCl (aq) + BaSO_4 (s)$.
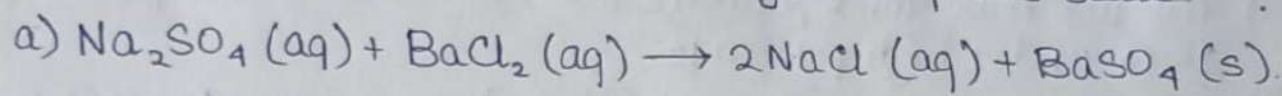
8) The small intestine is designed for maximum absorption of digested food.

i) The inner lining of the small intestine has numerous finger-like projections called villi.

ii) These villi ~~has~~ increase the surface area for absorption.

iii) Each villus has a network of thin and small blood vessels close to its surface

iv) The digested food is absorbed through the villi into these blood vessels

v) The large surface area, thin walls and rich blood supply make the small intestine highly efficient for absorption of nutrients!

9)

a) The movement of oxygenated blood in the body can be traced as follows :-

i) Oxygenated blood enters from lungs to the pulmonary blood stream to the left autrium

ii) It then passes to left ventricle

iii) From the left ventricle, the oxygenated blood is pumped into the aorta (main artery).

iv) The aorta branches into smaller arteries, which carry oxygenated blood to all parts of the body

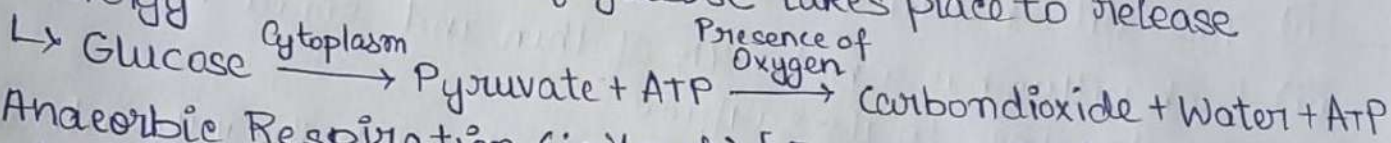v) After delivery of the oxygen, the blood becomes deoxygenated and returns to the heart through veins.

b) One structural difference between artery and veins are :-

i) Arteries have thick, elastic walls because blood flows through them under high pressure

ii) Veins have thin walls and often have valves to prevent backflow of blood since the blood flows under low pressure.

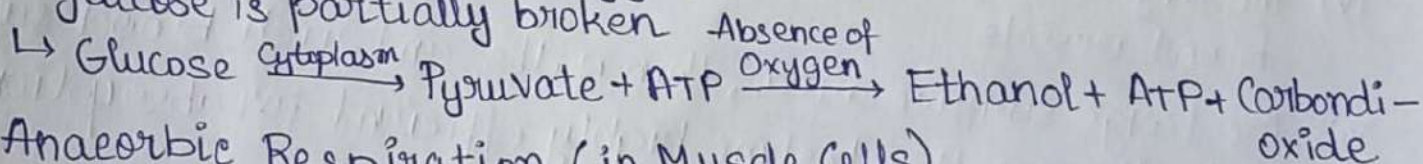**10)** The following processes can be defined as :-

i) Aerobic Respiration (in mitochondria of a cell) :-
  • Occurs in presence of oxygen
  • Complete breakdown of glucose takes place to release energy

$$\text{Glucose} \xrightarrow{\text{Cytoplasm}} \text{Pyruvate} + \text{ATP} \xrightarrow{\text{Presence of Oxygen}} \text{Carbondioxide} + \text{Water} + \text{ATP}$$

ii) Anaeorbic Respiration (in Yeast) [Fermentation] :-
  • Occurs in absense of oxygen
  • Glucose is partially broken

$$\text{Glucose} \xrightarrow{\text{Cytoplasm}} \text{Pyruvate} + \text{ATP} \xrightarrow{\text{Absence of Oxygen}} \text{Ethanol} + \text{ATP} + \text{Carbondioxide}$$

iii) Anaeorbic Respiration (in Muscle Cells)
  • When oxygen is insufficient, muscles respire anaerobically

$$\text{Glucose} \xrightarrow{\text{Cytoplasm}} \text{Pyruvate} + \text{ATP} \xrightarrow{\text{Lack of Oxygen}} \text{Lactic Acid} + \text{ATP}$$

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