

QUESTION No.01

MCOQ'S

- 1- (D)
- 2- (A)
- 3- (A)
- 4- (C)
- 5- (B)



QUESTION No.02

SHORT QUESTION'S

(i)
"Justification"

Positive rays produced by hydrogen gas are



basically protons & cathode rays are fast moving electrons. As protons are 1836 times heavier than electrons therefore the e/m value of hydrogen gas positive rays is 1836 times smaller than that of cathode rays.



(iii)
"Necessary to decrease pressure"

At high temperature greater number of molecules creates hindrance in way of electrons (cathode rays) pass through them. Therefore, it is necessary to decrease the pressure in discharge tube to get cathode rays.



(iii)
"Difference"

Frequency

Def:- Frequency (ν) is number of waves passing through a point per second.

Formula:- $\nu = c/\lambda$

Wave Number

Wave number ($\bar{\nu}$) is number of waves per unit length, and is reciprocal to wavelength

$$\bar{\nu} = 1/\lambda$$



QUESTION No. 03

→ Long QUESTION

∴ Millikan's oil drop method

→ Introduction:-

Millikan determined the charge on electron by a simple arrangement in 1909.

→ Composition:-

The apparatus consists of a metallic chamber. It has two parts. The chamber is filled with air, the pressure of which can be adjusted by a vacuum pump. There are also two electrodes A and A'.

→ Experiment:-

A fine spray of oil droplets

is created by an atomizer. A few droplets pass through the hole in the top plate and into a region between the charged plates, where one of them is observed through a microscope. This droplet, when illuminated perpendicularly to the direction of view, appears in the microscope as a bright speck against a dark background. The velocity of a droplet (V_1) depends upon its weight, mg .

$$V_1 \propto mg$$

⇒ Explanation:-

The velocity of the droplet (V_1) depends upon its weight, mg .

$$V_1 \propto mg$$

Where 'm' is the mass of the droplet and 'g' is the acceleration due to gravity. After that, the electrodes are ionized by X-rays. Now connect A and A' to a battery which generates an electric field having a strength E. The droplet moves upwards against the action of gravity with a velocity (V_2).



$$V_2 \propto Ee - mg$$

where 'e' is the charge on electron and Ee is the upward driving force on the droplet due to applied electrical field of strength E .

Dividing equation (1) by (2):-

$$\frac{V_1}{V_2} = \frac{mg}{Ee - mg}$$

The values of V_1 and V_2 are reached and recorded with the help of a microscope.

