Question 5: Two monochromatic beams A and B of equal intensity I, hit a screen. The number of photons hitting the screen by beam A is twice that by beam B. Then, what inference can you make about their frequencies?

Solution: From planck's equation,

$$E=nhf$$

where n= no. of electrons

f = frequency of beam

$$f=E/nh$$

as E is constant as intensity is constant and h is planck's constant. Therefore f is inversely proportional to n.

$$\frac{f1}{f2} = \frac{n2}{n1}$$

$$f2 = 2f1$$

Therefore, frequency of beam B is twice of beam A.