

## QUIZ - Problem

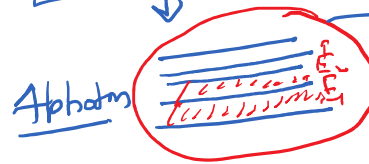
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$E = 6.125 \text{ Joule}$  — using Classical Mech.

$$\Delta E = h\nu \Rightarrow 7.4 \times 10^{-34}$$

$$n_{\text{photon}} = 8.3 \times 10^{33}$$

6.125 Joule  
↓  
Classical Mech.



$$\begin{aligned} E_1 &= h\nu \\ E_2 &= 2h\nu \\ E_3 &= 3h\nu \end{aligned}$$

## Module-3 :- Nanophysics



Nano + physics

$$1 \text{ nanometer} = 10^{-9} \text{ meter}$$

$$1 \text{ nanometer} = \frac{\text{meter}}{1000000000}$$

⇒ If the size of material lies in between 1 to 100 nm. Then we consider them as nanomaterials.

⇒ Nanomaterial will show different properties from their bulk counterparts.

Material	— Bulk properties	— Nonmaterial property
→	— Inert	— Conductor/Semiconductor
→ Al	— Stable Nature	— Catalytic Property
		— <u>Corrosible</u>

As you change the size of material — It leads to the Change in properties of matter.

Broad classification as per their size

P. L. N. L. N.

— Diameter (nm)

Particle type	—	Diameter (nm)
(i) atoms and small molecules	—	0.1 nm
(ii) Nanomaterial	—	1 to 100 nm ✓
(iii) Fine particles ( $PM_{2.5}$ )	—	100 to 2500 nm
(iv) <u>Coarse</u> particles ( $PM_{10} \sim$ dust)	—	2500 to 10,000 nm
Thickness of paper	—	$\sim 100,000$ nm

§ Moore's law :— The chips are known as Integrated Circuits (ICs).

They are the part of Electronic items.

Transistors are the main component of ICs.

↳ An observation was made by Gordon E. Moore in 1965.

He said that number of transistor becomes double in Every 2-years.

That is known as Moore's law.

No. of transistors per square inch on ICs  
become double Every two years since their Innovation

↳ This law was so accurate that it predicted the growth of transistors in well agreement upto 2013 from 1965

After 2013 ~ The doubling time become 3 years