Photoelectric Effect

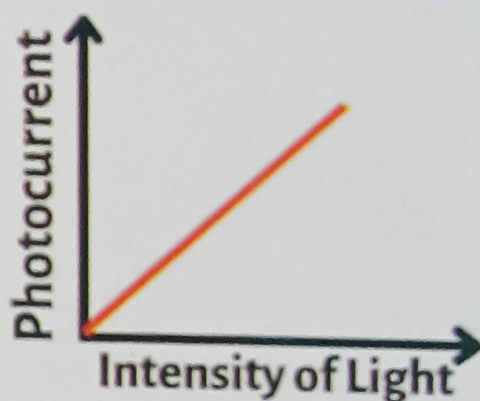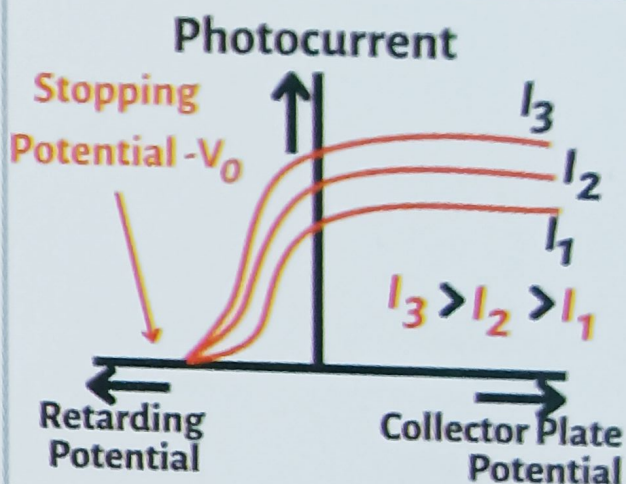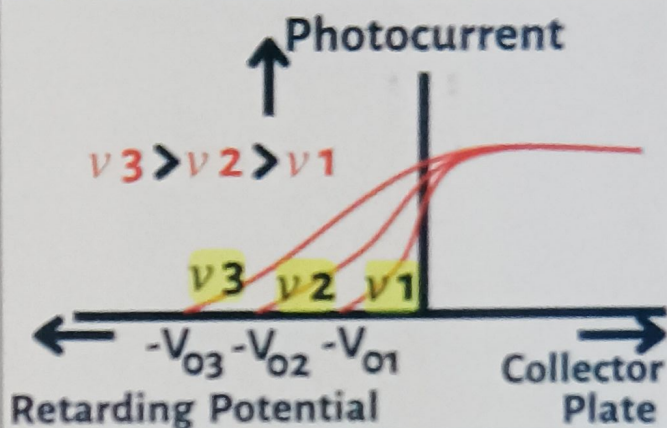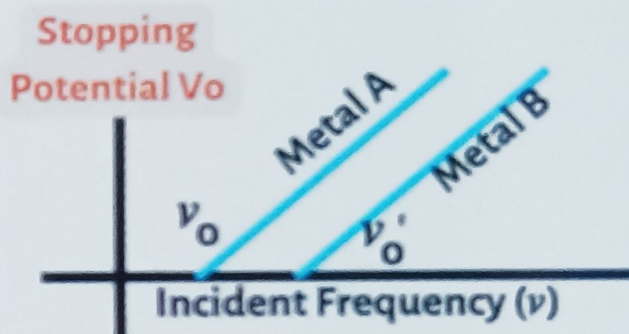|	
Einstein's Photoelectric Equation	$(E_K)_{max} = hv - \phi = h(v - v_0)$ v is frequency of incident light v_0 is threshold frequency
Stopping Potential	$(E_K)_{max} = \dfrac{1}{2} m v_{max}^2 = eV_0$ $eV_0 = hc\left(\dfrac{1}{\lambda} - \dfrac{1}{\lambda_0}\right)$
Variation of Photoelectric current with intensity of light	
Variation of photocurrent with collector plate potential for different intensity of incident radiation	

For emission of electron from a surface $hv \gg \phi_0$

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Variation of photoelectric current with collector plate potential for different frequencies of incident radiation	

Photocurrent

$v3 > v2 > v1$

$v3$ $v2$ $v1$

$-V_{03}$ $-V_{02}$ $-V_{01}$

Retarding Potential

Collector Plate

Variation of stopping potential V_0 with frequency v of incident radiation for a given photosensitive materia	

Stopping Potential Vo

Metal A

Metal B

V_0

V_0'

Incident Frequency (v)

Services	Frequency bands	Remarks
Standard AM broadcast	540-1600 kHz	Radio broadcast
FM broadcast	88-108 MHz	Music channel
Television	54-72 MHz	VHF (Very High Frequencies)
	76-88 MHz 174-216 MHz 420-890 MHz	TV UHF (Ultra High Frequencies) TV
Cellular	896-901 MHz	Mobile to base station
Mobile radio	840-935 MHz	Base station to mobile
Satellite	5.925-6.425 GHz	Uplink
Communication	3.7-4.2 GHz	Downlink

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