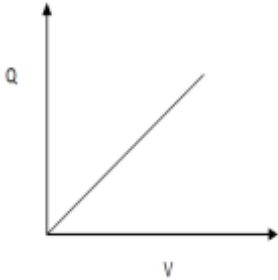


Graphical Questions in class XII Physics

- 1 Draw a plot to show variation of the charge  $Q$  stored in a capacitor and the potential difference  $V$  between the plates.

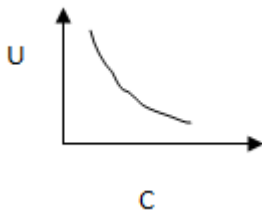


Slope will give capacitance  $C = (\Delta Q / \Delta V)$ .

Area under the graph gives energy stored in the capacitor.

- 2

Draw a plot to show variation of the energy stored  $U$  in a capacitor and capacitance  $C$  of the capacitors when  $Q$  is constant



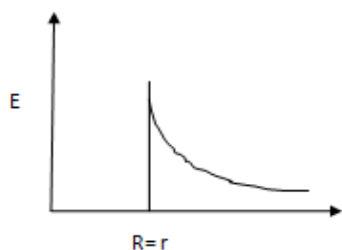
- 3 Draw a plot to show variation of the electric field strength  $E$  with distance  $r$  from the centre of a charged spherical shell of radius  $R$ .

When

$$r < R, E = 0$$

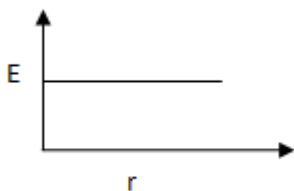
$r = R, E$  is maximum

$$r > R, E \propto \frac{1}{r^2}$$



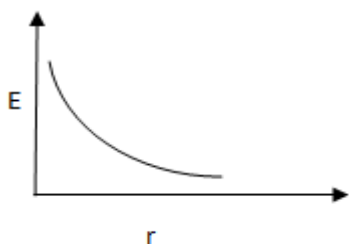
- 4 Draw a plot to show variation of the electric field strength  $E$  with distance  $r$  from infinite sheet of charge.

$E$  is independent of distance from infinite sheet of charge

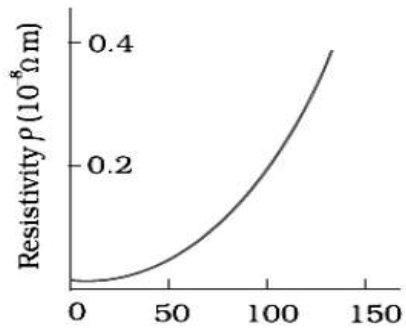


- 5 Draw a plot to show variation of the electric field strength  $E$  with distance  $r$  from infinite Linear charge distribution.

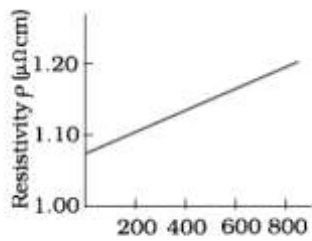
$$E = 2k\lambda/r$$



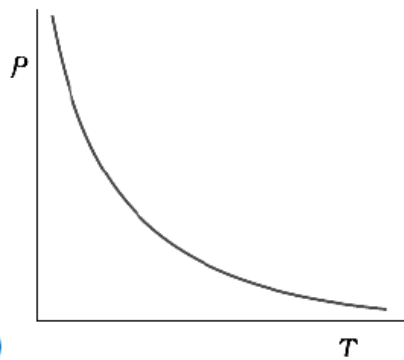
- 6 Draw a plot to show variation of the resistivity  $\rho$  with temperature  $T$  for
- metal eg. copper
  - alloy eg. nichrome
  - semiconductor eg. Si or Ge or insulator
  - super conductor



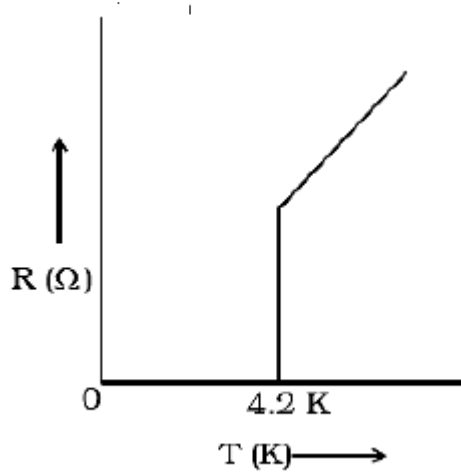
i) Temperature  $T$  (K)  $\rightarrow$



(ii) Temperature  $T$  (K)  $\rightarrow$

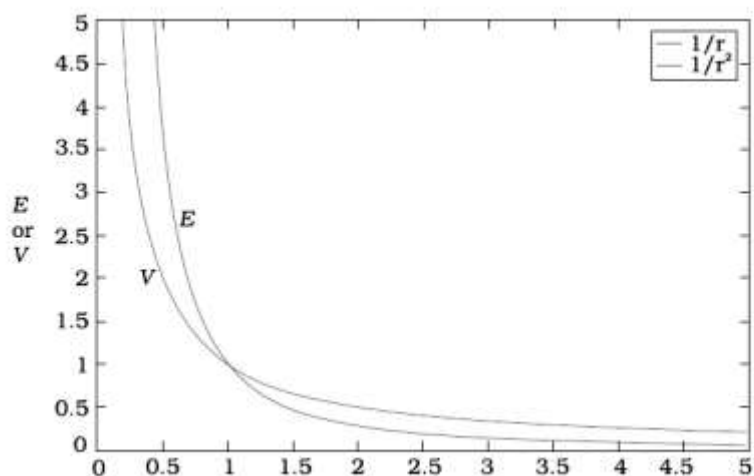


(iii)



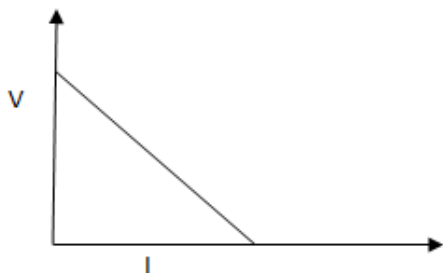
iv)

- 7 Draw a plot to show variation of the electric potential  $V$  and electric field strength  $E$  due to a point charge with distance  $r$ .



8

Draw a plot to show variation of terminal potential difference of a cell  $V$  with current  $I$  drawn from the cell.



Y intercept gives emf of the cell  $V = \epsilon$ , when  $I = 0$

$r = \frac{\epsilon - V}{I}$  is the internal resistance .

9 Draw a plot to show variation of i) terminal potential difference ii) emf with external resistance .

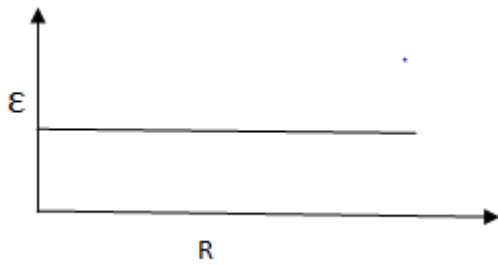
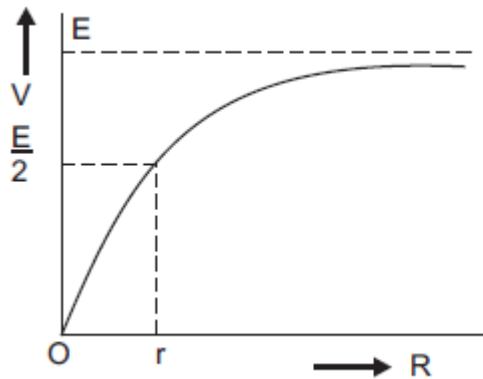
$$V = IR = \left( \frac{E}{R + r} \right) R = \frac{E}{1 + \frac{r}{R}}$$

When  $R \rightarrow 0, V = 0$

When  $R = r, V = \frac{E}{2}$

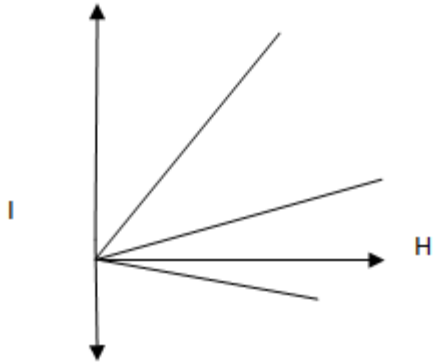
When  $R = \infty, V = E$

The graph is shown in fig.



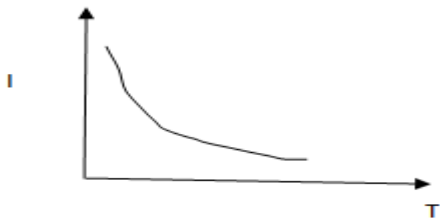
- 10 Draw a plot to show variation of intensity of magnetization and magnetizing field strength for  
 A Diamagnetic  
 B paramagnetic  
 C ferromagnetic substance. What does the slope of the graph give?  
 Slope gives magnetic susceptibility substance  $\chi$

ferromagnetic substance  $\chi$  is high and +ve  
 paramagnetic substance  $\chi$  is low and +ve  
 Diamagnetic substance  $\chi$  is low and -ve

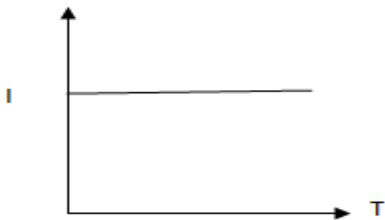


11 Draw a plot to show variation of intensity of magnetization with temperature

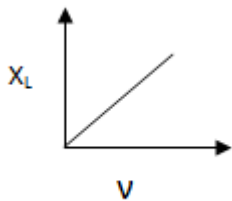
For paramagnet and ferromagnet



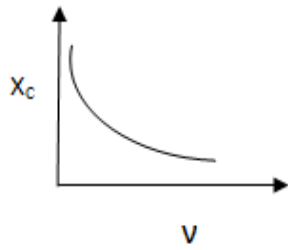
For diamagnet



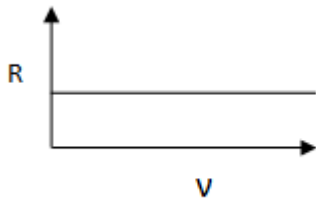
12 Draw a plot to show variation of inductive reactance with frequency of ac



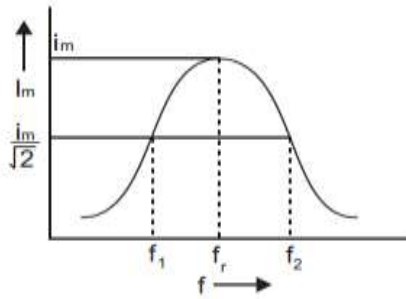
13 Draw a plot to show variation of capacitive reactance with frequency of ac



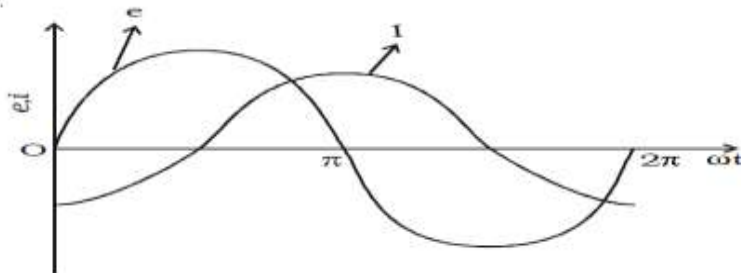
14 Draw a plot to show variation of resistance with frequency of ac

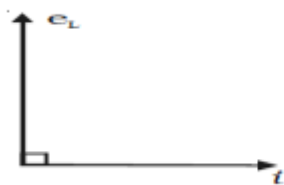


15 Draw a plot of variation of current in an LCR circuit with frequency .

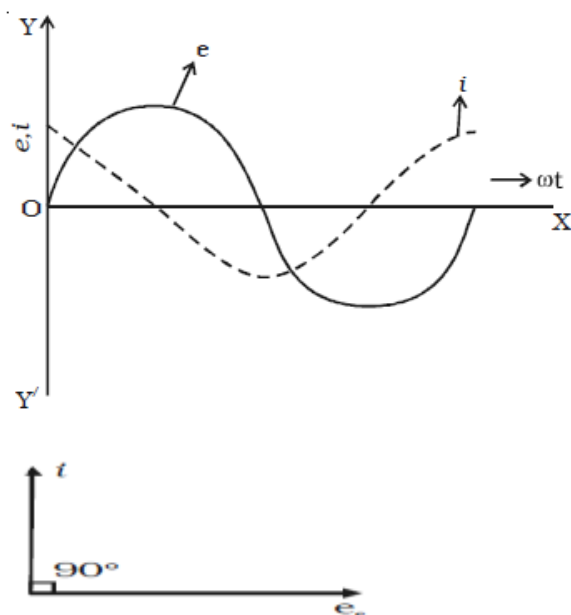


16 Draw a graph to show variation of emf and current with phase for an ac circuit with only inductor, and draw phasor diagram also.

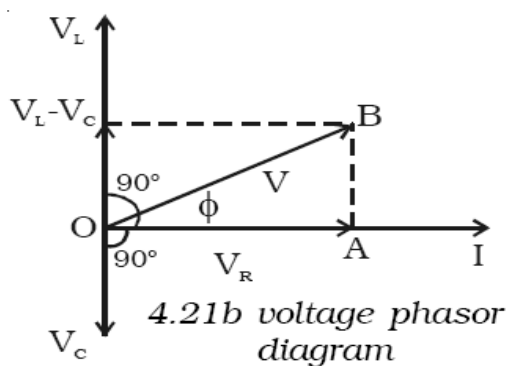




- 17 Draw a graph to show variation of emf and current with phase for an ac circuit with only capacitor, and draw phasor diagram also.

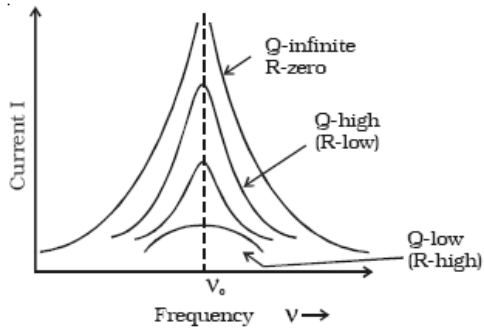


- 18 Draw phasor diagram of voltage current in LCR series circuit

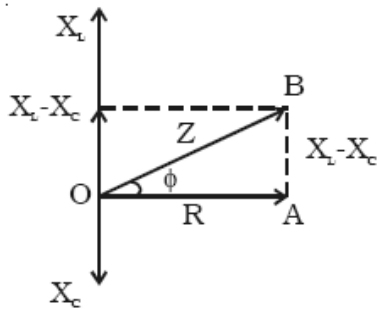


- 19 Draw a plot to show variation of current with frequency in resonance circuits of varying Q factors

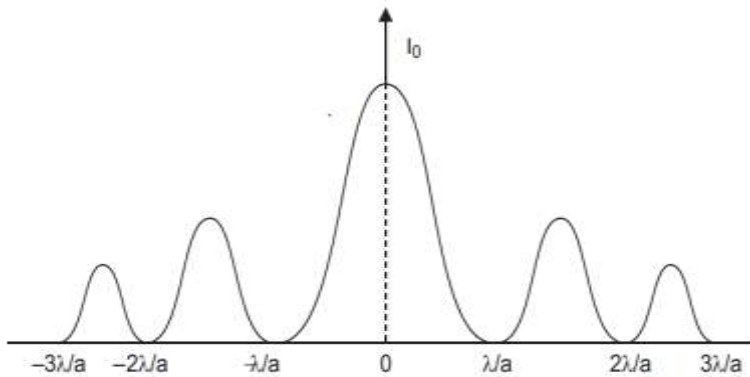




20 Draw impedance diagram for LCR series circuit

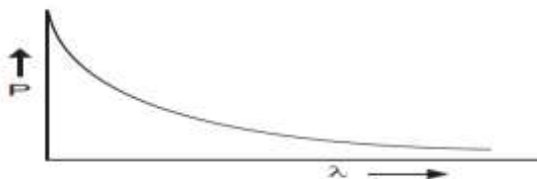


21 Draw a plot of intensity distribution in single slit diffraction experiment.

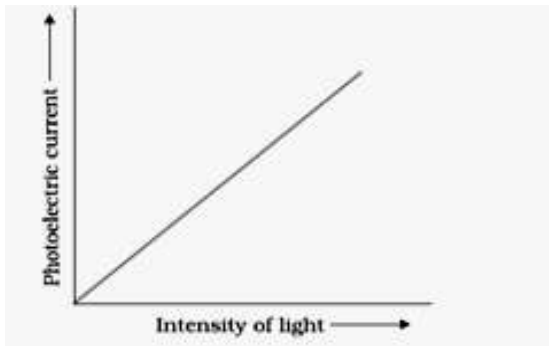


22

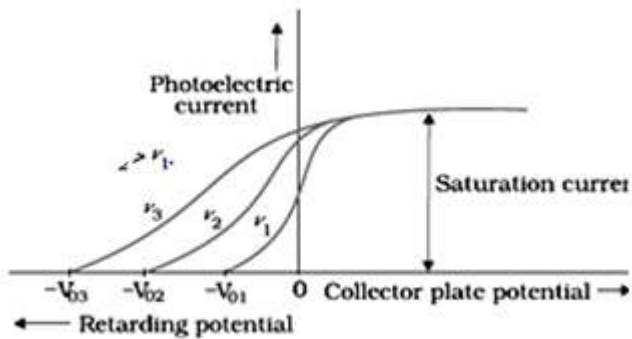
Draw a plot to show variation of power  $P$  of a lens with wavelength of light  $\lambda$  used



23 Draw a plot to show variation of Photo electric current with the intensity of incident radiation.



- 24 Draw a plot to show variation of photoelectric current with anode ( collector plate)potential for radiations of same intensity but different frequencies. Arrange the frquencies in increasing order.

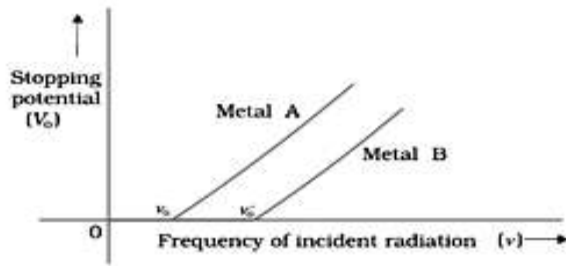


25

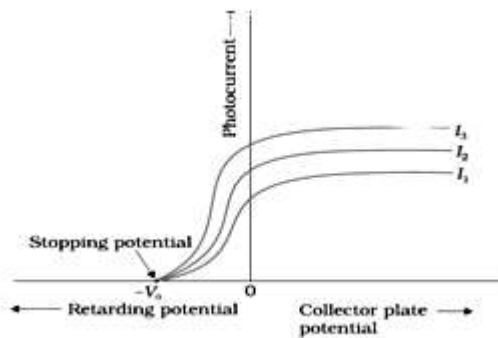
Answer the following questions with respect to the graph given below .

Which of the two metals i) has more work function ii) will emit photo electron of more kinetic energy. iii) has more threshold wavelength?

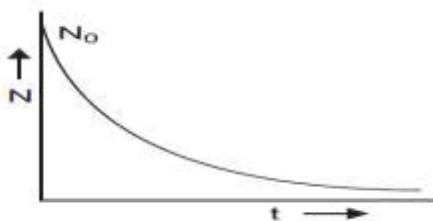
i) metal B ii) metal A ii) metal A



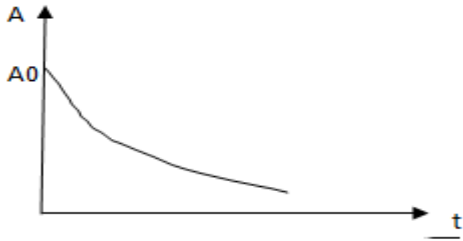
- 26 Draw a plot to show variation of photoelectric current with anode ( collector plate)potential for radiations of same frequency but different intensities. Arrange the intensities in increasing order.



- 27 Draw a plot to show variation of number of nuclei remaining with time for a radio active substance

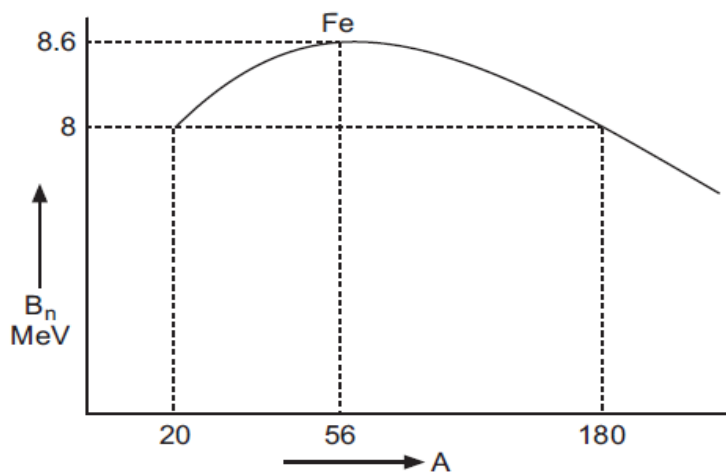


- 28 Draw a plot to show variation of activity of radioactivity substance with time .

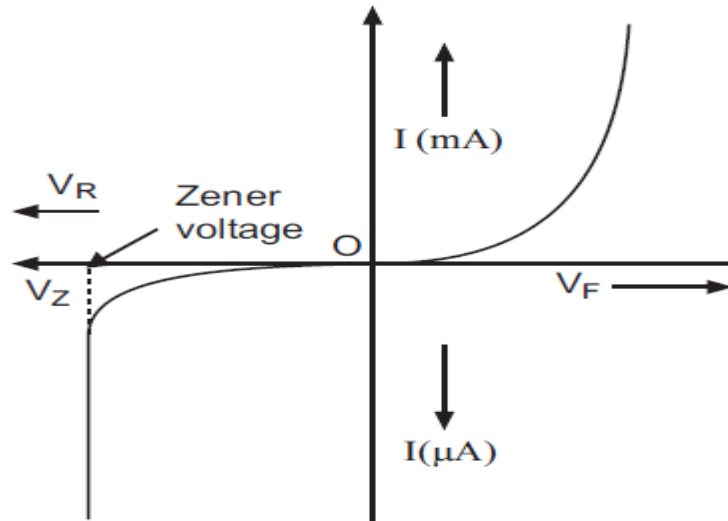


29

Draw a plot to show variation of binding energy per nucleon  $B_n$  with mass number  $A$  of nuclei

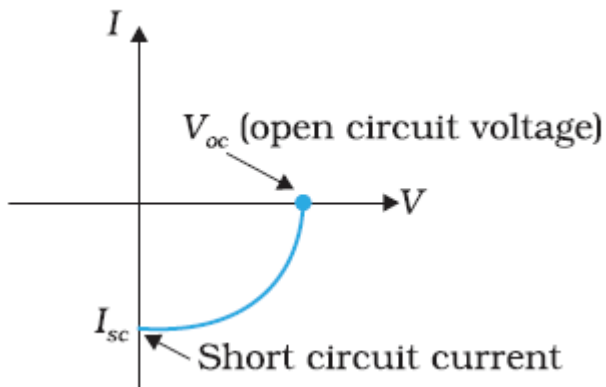


30 Draw a plot to show variation of current with voltage in the forward and reverse bias mode of a zener diode and mark zener break down voltage.



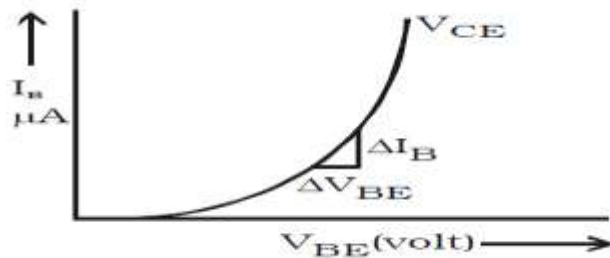
31

Draw V-I characteristics of Solar cell



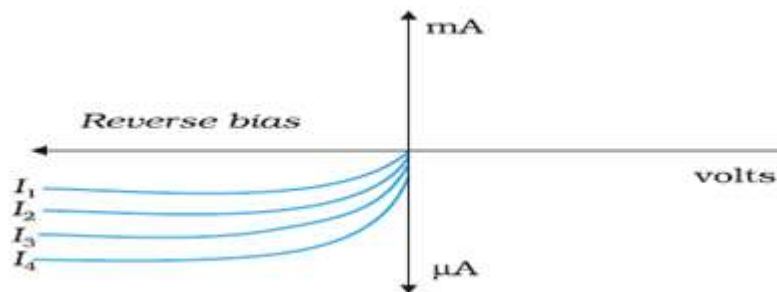
32

Draw input characteristics of a NPN transistor.

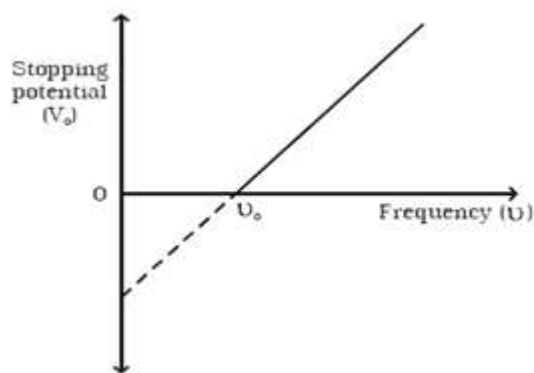


33

Draw V-I characteristics of photo diode. Arrange the intensities of incident radiation in increasing order.



- 34 Draw a plot to show variation of stopping potential with frequency of incident radiation. Find i) threshold frequency ii) work function iii) planck's constant.



$$eV_0 = h\nu - h\nu_0$$

dividing by e we get

$$V_0 = \left(\frac{h}{e}\right)\nu - \left(\frac{h}{e}\right)\nu_0$$

This is an equation of a straight line.

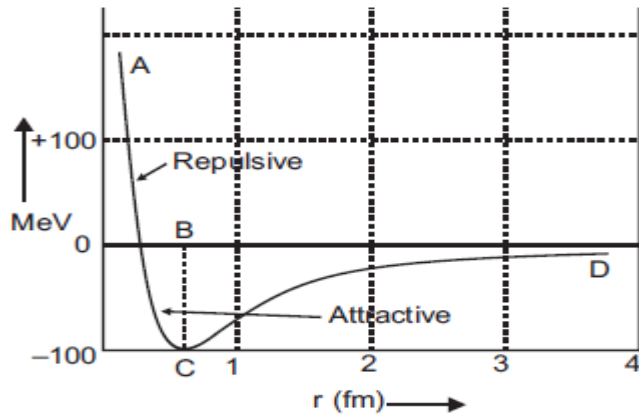
$y = mx + C$ . Slope  $m = (\text{Planck's constant} / e)$

Planck's constant  $h = \text{slope} \times e$ . ( $e = 1.6 \times 10^{-19} \text{C}$ )

y intercept =  $(-h/e)\nu_0$ .

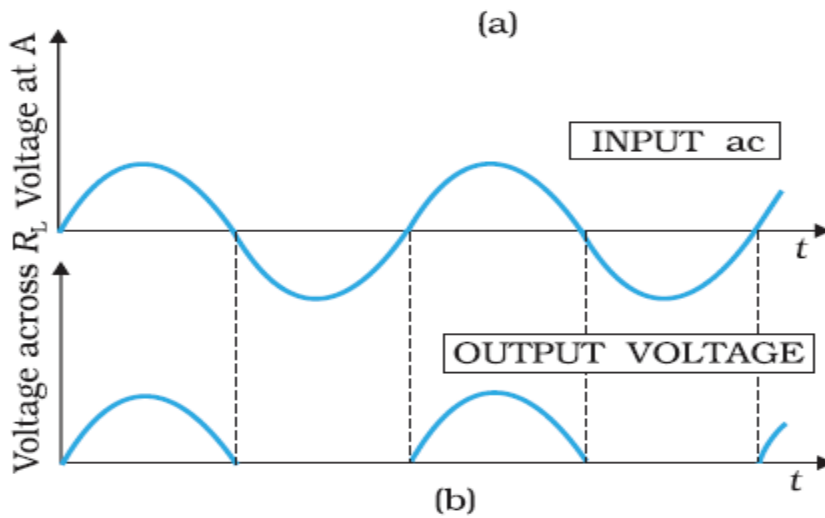
work function = - y intercept  $\times e$

35. Draw a plot to show variation of potential energy with separation between two nucleons.

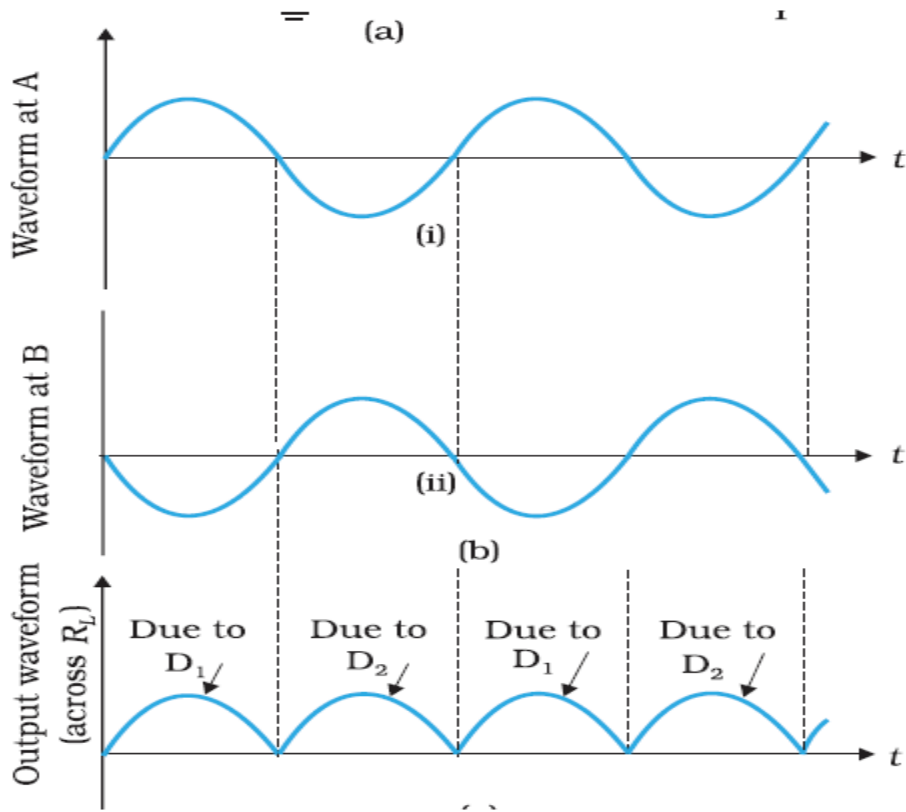


Part AB represents repulsive force and part BCD represents attractive force. At C  $r = r_0$   $r_0$  is equilibrium separation. When  $r < r_0$ , the force is repulsive. When  $r > r_0$  the force is attractive.

36 Draw the input and output waveforms for i) a half wave rectifier ii) full wave rectifier



Half wave rectifier



Input and Out put of full wave rectifier.