

INDIAN SCHOOL MUSCAT

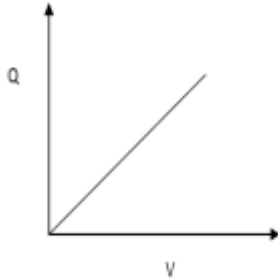
SENIOR SECTION

DEPARTMENT OF PHYSICS

Rapid revision

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.

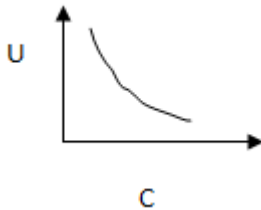


Slope will give capacitance $C = (\Delta Q / \Delta V)$.

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



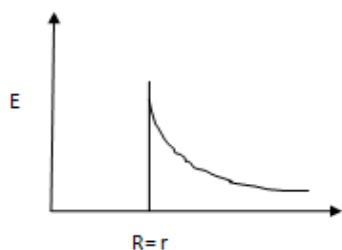
- 3 Draw a plot to show variation of the electric field strength E with distance r from the centre of a charged spherical shell of radius R .

When

$$r < R, E = 0$$

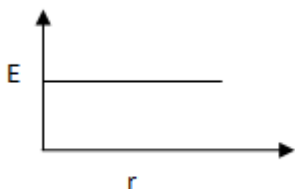
$r = R, E$ is maximum

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



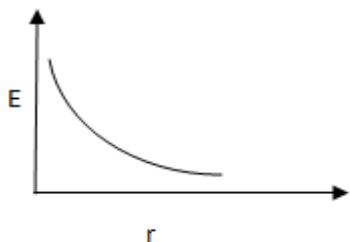
- 4 Draw a plot to show variation of the electric field strength E with distance r from infinite sheet of charge.

E is independent of distance from infinite sheet of charge

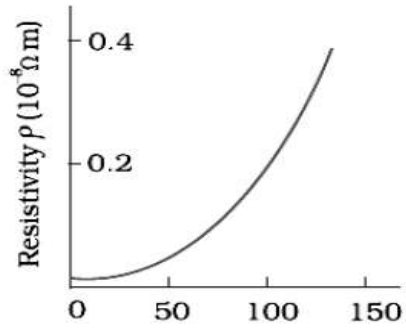


- 5 Draw a plot to show variation of the electric field strength E with distance r from infinite Linear charge distribution.

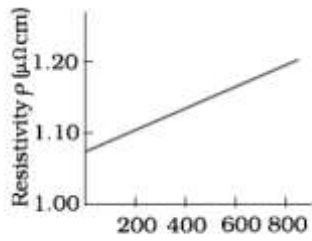
$$E = 2k\lambda/r$$



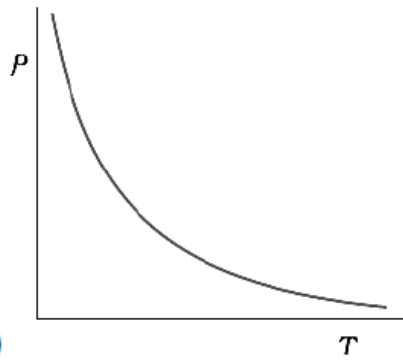
- 6 Draw a plot to show variation of the resistivity ρ with temperature T for
- i) metal eg.copper
 - ii) alloy eg. nichrome
 - iii) semiconductor eg.Si or Ge or insulator
 - iv) super conductor



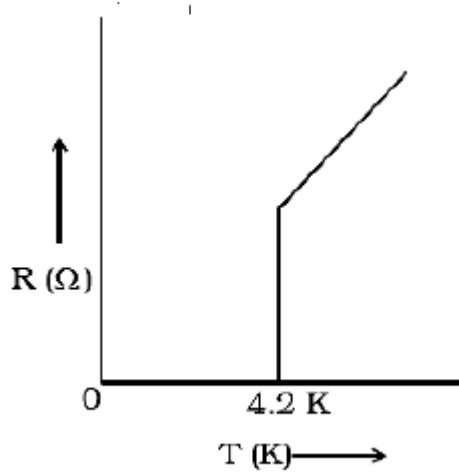
i) Temperature T (K) \rightarrow



(ii) Temperature T (K) \rightarrow

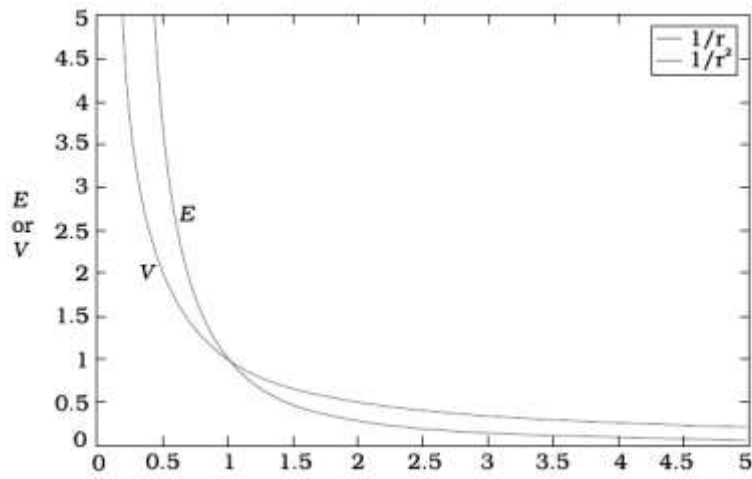


(iii)

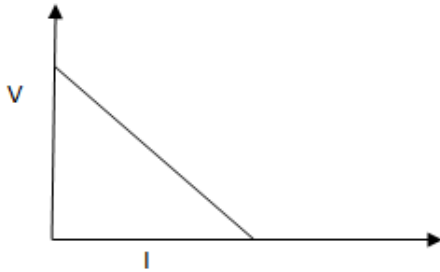


(iv)

- 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 .

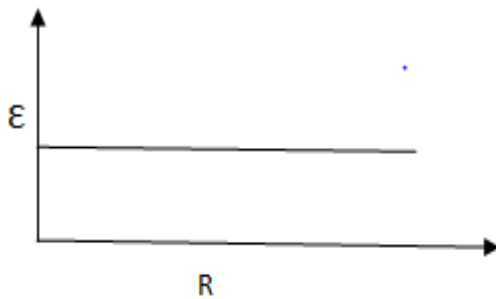
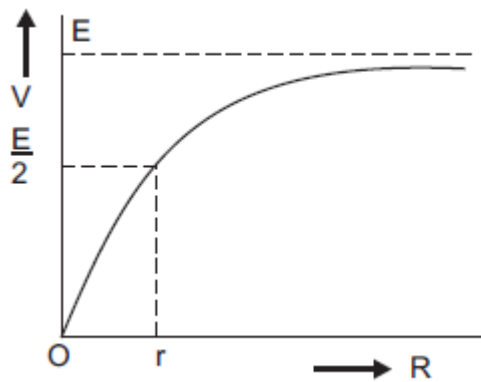
$$V = IR = \left(\frac{E}{R+r} \right) R = \frac{E}{1 + \frac{r}{R}}$$

When $R \rightarrow 0, V = 0$

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

When $R = \infty, V = E$

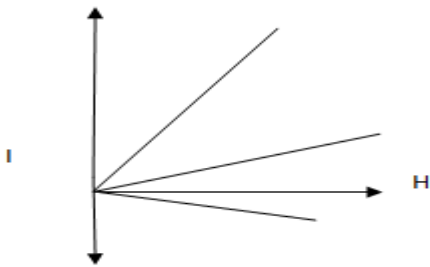
The graph is shown in fig.



- 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?

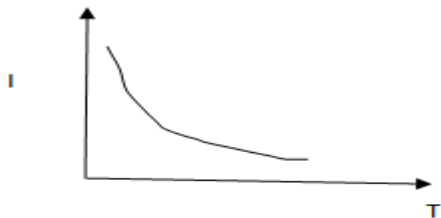
Slope gives magnetic susceptibility substance χ

ferromagnetic substance χ is high and +ve
 paramagnetic substance χ is low and +ve
 Diamagnetic substance χ is low and -ve

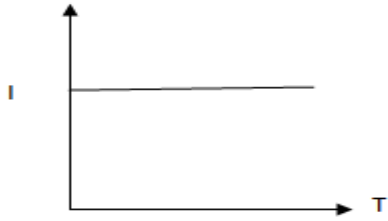


- 11 Draw a plot to show variation of intensity of magnetization with temperature

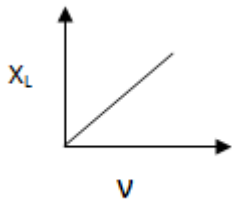
For paramagnet and ferromagnet



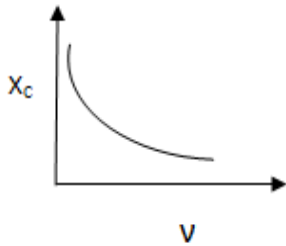
For diamagnet



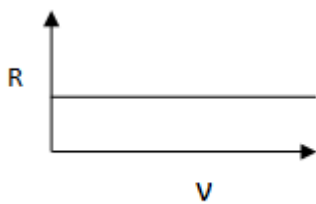
- 12 Draw a plot to show variation of inductive reactance with frequency of ac



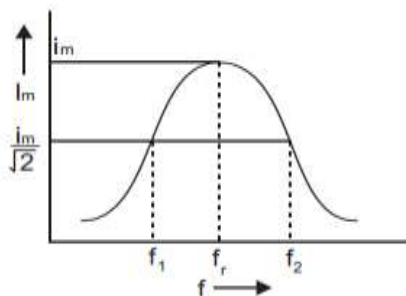
- 13 Draw a plot to show variation of capacitive reactance with frequency of ac



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

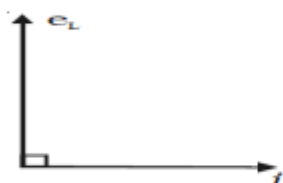
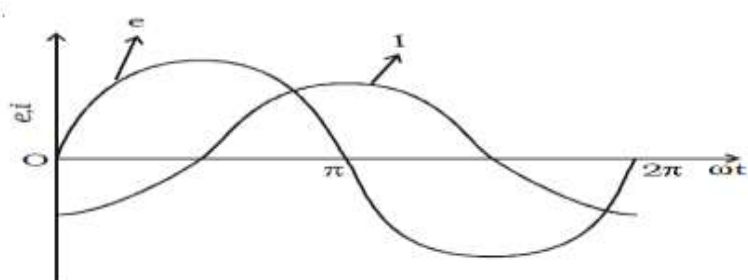


- 15 Draw a plot of variation of current in an LCR circuit with frequency .

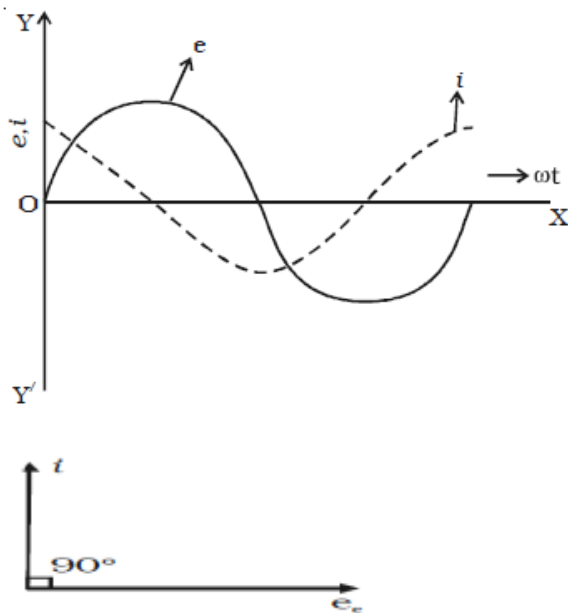


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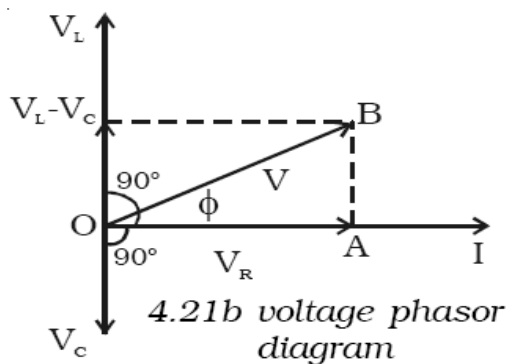
Draw a graph to show variation of emf and current with phase for an ac circuit with only inductor, and draw phasor diagram also.



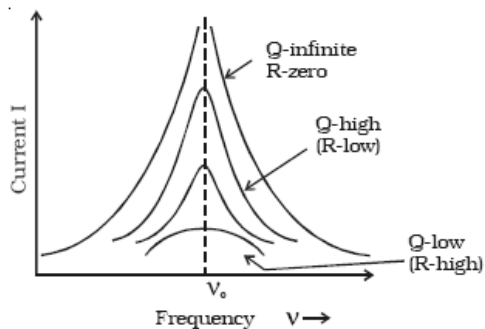
17 Draw a graph to show variation of emf and current with phase for an ac circuit with only capacitor, and draw phasor diagram also.



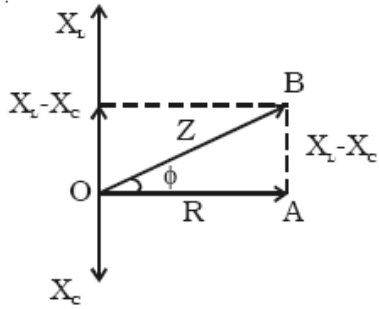
18 Draw phasor diagram of voltage current in LCR series circuit



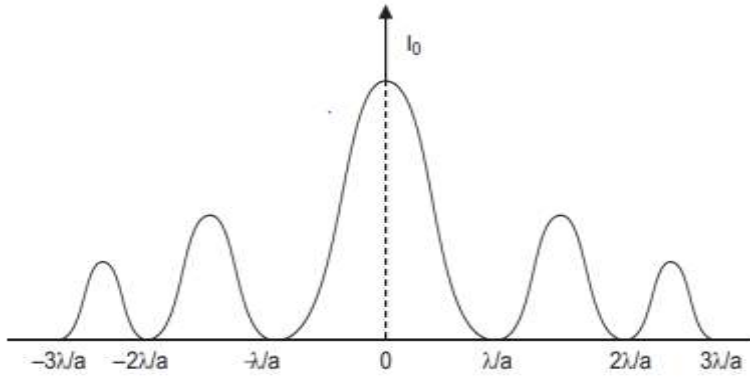
19 Draw a plot to show variation of current with frequency in resonance circuits of varying Q factors



20 Draw impedance diagram for LCR series circuit

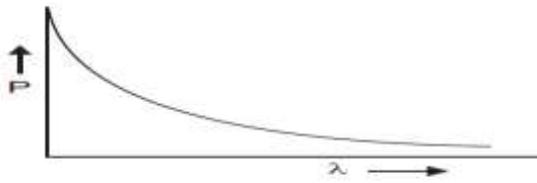


21 Draw a plot of intensity distribution in single slit diffraction experiment.

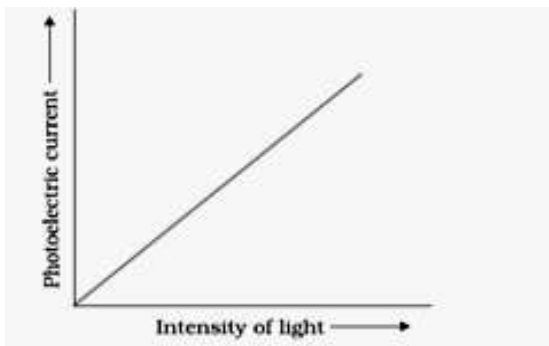


22

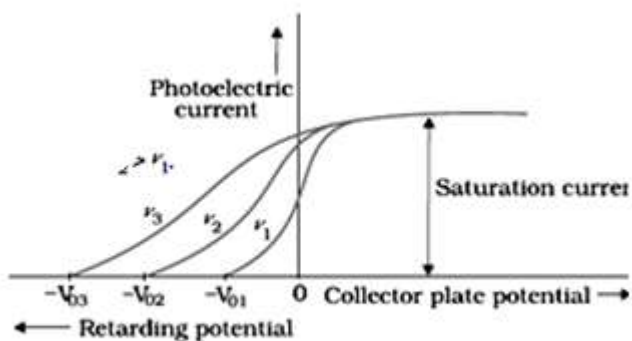
Draw a plot to show variation of power P of a lens with wavelength of light λ used



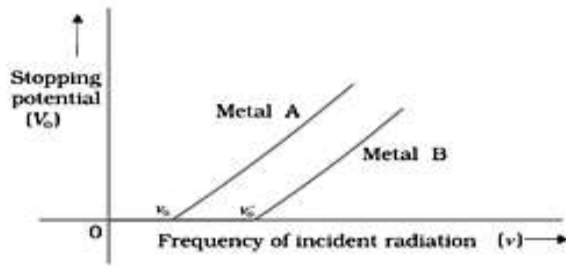
23 Draw a plot to show variation of Photo electric current with the intensity of incident radiation.



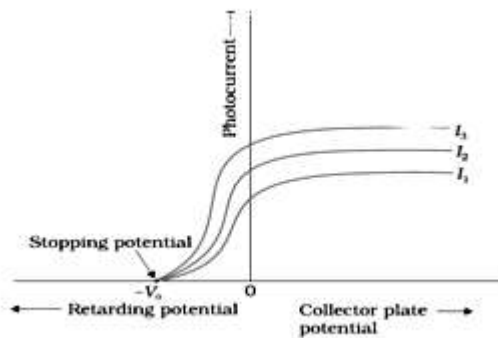
- 24 Draw a plot to show variation of photoelectric current with anode (collector plate)potential for radiations of same intensity but different frequencies. Arrange the frquencies in increasing order.



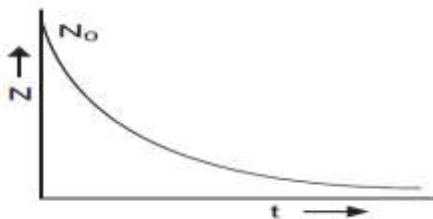
- 25 Answer the following questions with respect to the graph given below .
 Which of the two metals i) has more work function ii) will emit photo electron of more kinetic energy. iii) has more threshold wavelength?
 i) metal B ii) metal A ii) metal A



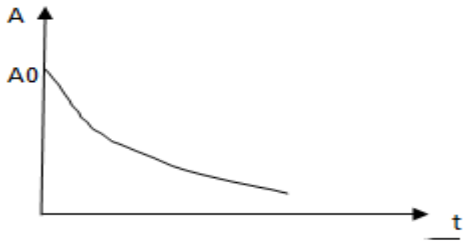
- 26 Draw a plot to show variation of photoelectric current with anode (collector plate)potential for radiations of same frequency but different intensities. Arrange the intensities in increasing order.



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

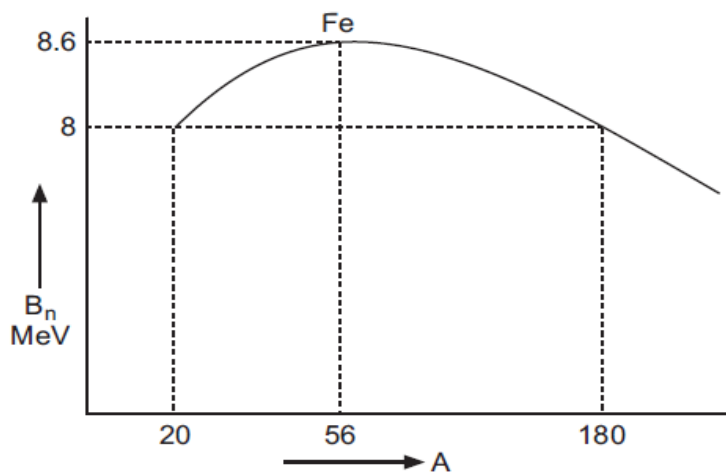


28 Draw a plot to show variation of activity of radioactivity substance with time .

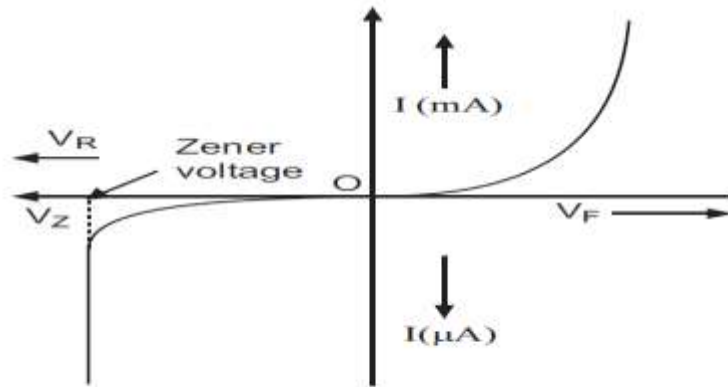


29

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

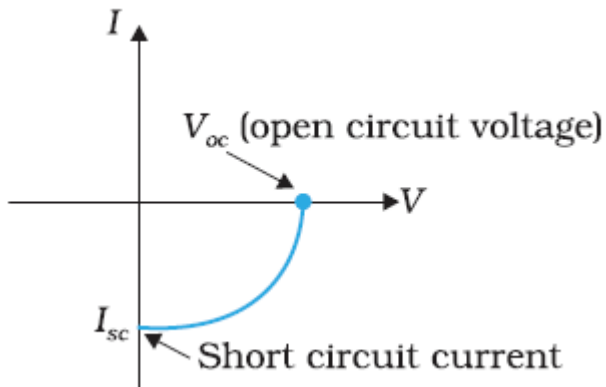


30 Draw a plot to show variation of current with voltage in the forward and reverse bias mode of a zener diode and mark zener break down voltage.

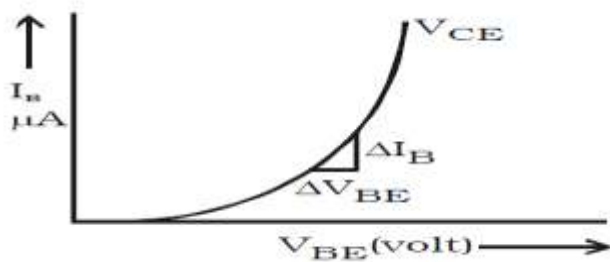


31

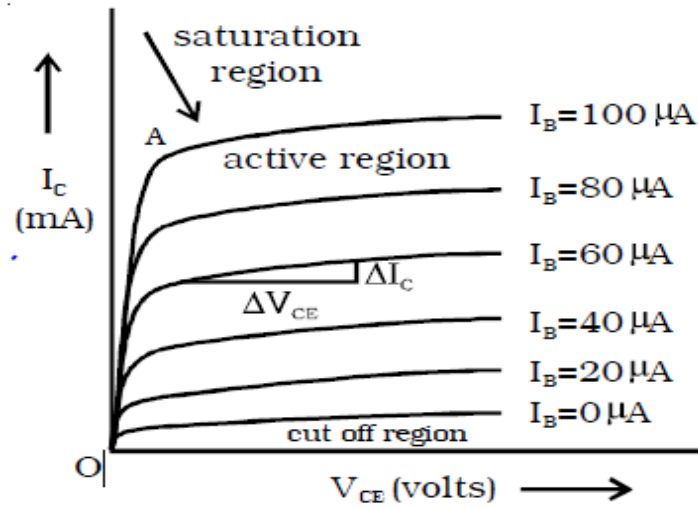
Draw V-I characteristics of Solar cell



32 Draw input characteristics of a NPN transistor.

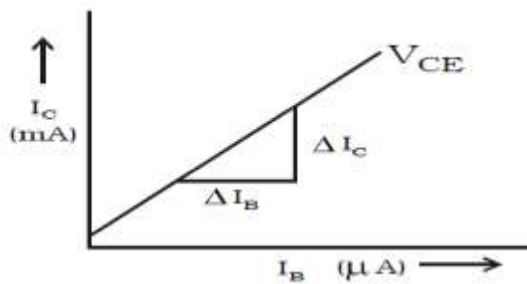


33 Draw output characteristics of transistor.



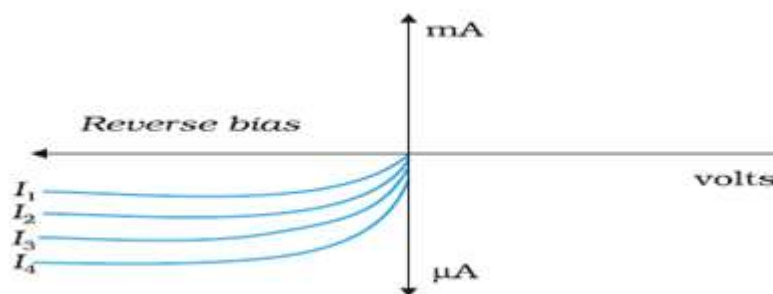
34

Draw transfer characteristics of a NPN transistor

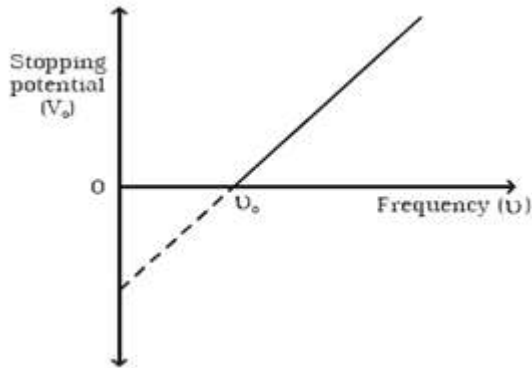


35

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



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



$$eV_o = h\nu - h\nu_o$$

dividing by e we get

$$V_o = \left(\frac{h}{e}\right)\nu - \left(\frac{h}{e}\right)\nu_o$$

This is an equation of a straight line.

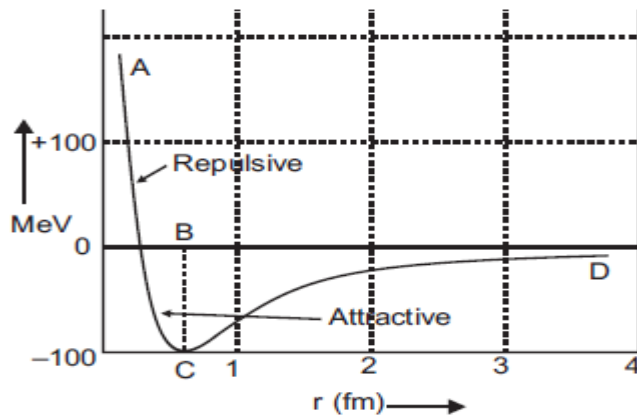
$y = mx + C$. Slope $m = (\text{Planck's constant} / e)$

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

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

work function = $-y \text{ intercept} \times e$

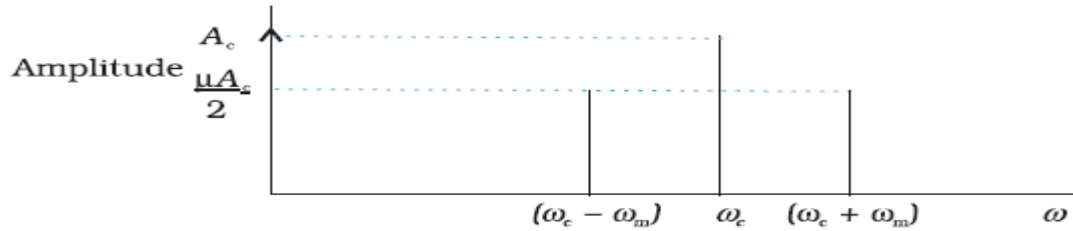
37. Draw a plot to show variation of potential energy with separation between two nucleons.



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.

38 Draw a graph to show variation of amplitude with angular frequency of three components of amplitude modulated wave.

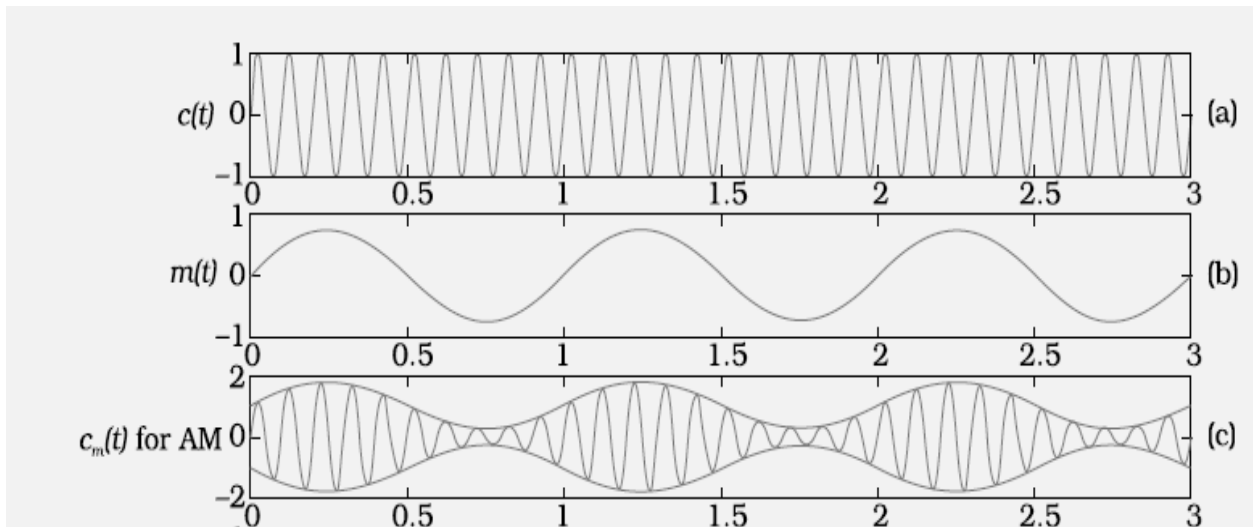


LSB and USB have amplitude of

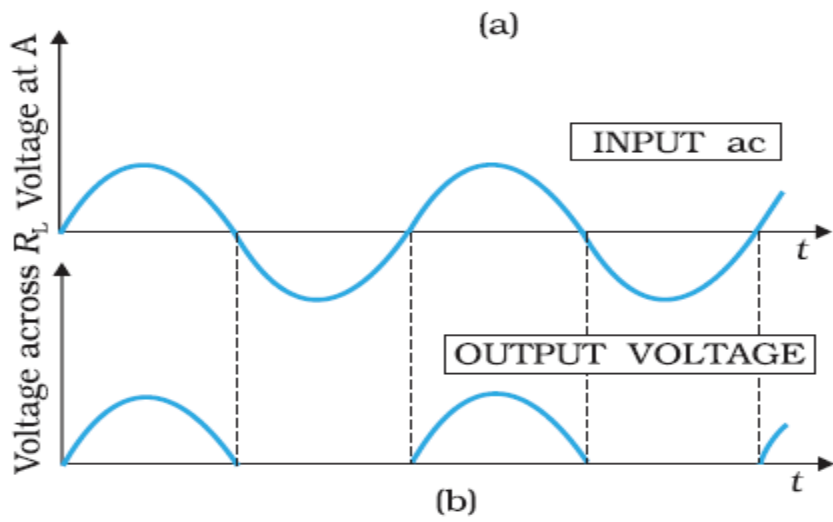
$$\frac{\mu A_c}{2}$$

Carrier wave has an amplitude of A_c

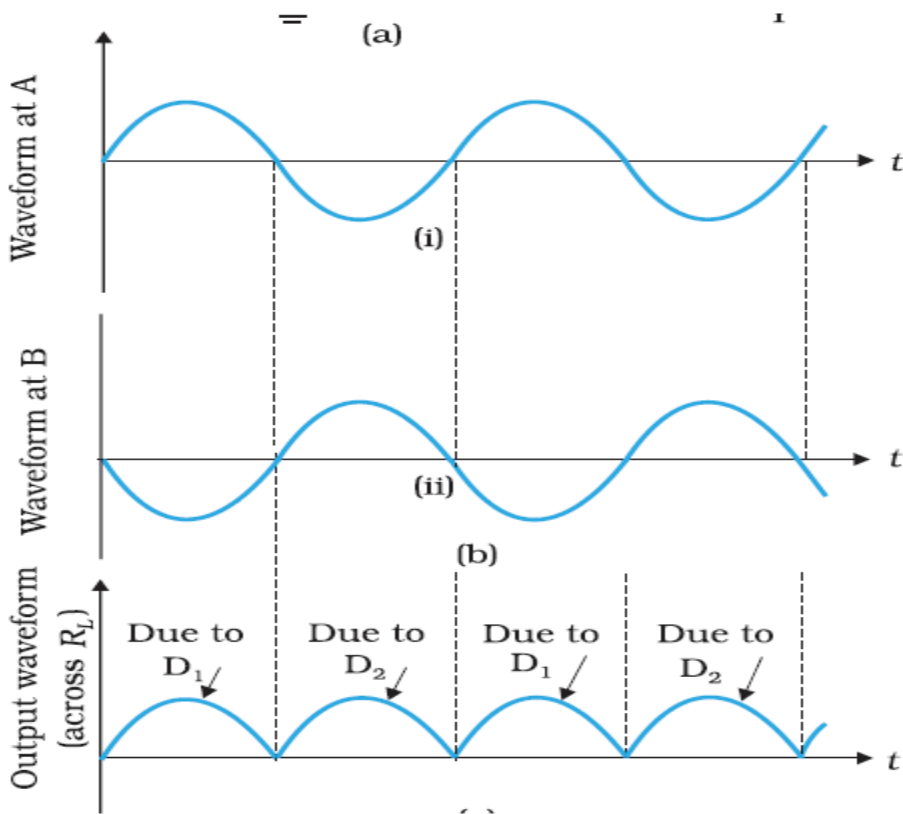
39. Draw a graph to show variation of i) carrier wave $c(t)$ ii) message signal $m(t)$ iii) amplitude modulated wave with time.



40. Draw the input and output waveforms for i) half wave rectifier ii) full wave rectifier



Half wave rectifier



full wave rectifier.