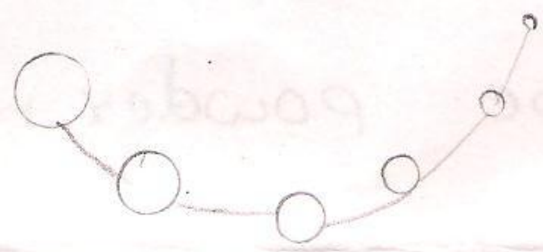
chapter - 1 :-

1) Explain various types of bonding in crystals with examples.

2) Explain the inter atomic forces existing btw the atoms hence derive an equation for equilibrium distance btw two atoms.

3) Plot and explain the variation of P.E with interatomic distance for

1. attractive force
2. repulsive force
3. resultant force.



4) What is mandelang constant hence obtain an expression for the P.E of an ionic crystal.

5) Define the following

a) basis b) space lattice c) unit cell

6) Describe the 7 crystal systems with diagrams.

7) Show that FCC has highest packing factor compared with BCC and S.C by working out the packing factor.

8) what are miller indices, how do you obtain for a given plane in a crystal.

(a) Derive an expression for inter planer facing btw two adjaced planes in a simple cubic structure.

Chapter - 2

1) What is brags law obtain an expression for it.

2) Describe Laues method of determination of crystal structure.

3) Describe powder method of x-ray diffraction

4) What are point defects, derive an expression for concentration of shortkey deffects in a crystal.

5) Distinguish btw Frenkel & shortkey deffects in crystal, obtain expression for equilibrium concentration at a given temp.

(6) Distinguish btw edge & screw dislocation. Explain what is burger's vector.

Chapter - 3.

1) Explain the differences btw 3 types of mechanics.

2) state the max-well boltsman distribution law of energy. Hence obtain an expression for it.

3) Deduce plank's law of black body radiation on the basis of Bose Einstien statistics. (Photon gas)

4) Define Fermi energy, derive an expression for the Fermi energy of a system with free e's at 0°K.

5) What are matter waves. Derive an exp. for debroglie wavelength associated with an e⁻.

6) Describe how matter waves are verified on the basis of davission germer and G P Thomson's experiment

7) Derive schrodinger time independent wave equation.

8) Explain the physical signigificance of the wave function 'ψ'. deduce an expression for the energy of e⁻ in an infinitely potential well in 1D

chapter - IV

1) Explain the origin of band gap e^- is moving in a periodic potential (kronic penny model)

2) what are brillouin & explain how energy bands are formed in solids.

3) what are the difference btw metals, semiconductors and insulators.

4) what is effective mass of an $\bar{e}$, obtain an expression for it.

DERV & graph

chapter - VII

1) Explain the following.

a) stimulated absorption.

b) spontaneous emision and population inversion.

2) what are Einstein coefficients, derive them

3) what are the characteristics of laser & mention any 4 applications of laser.

4) Describe the construction & working of a ruby laser.

5) Describe with suitable diagram, the principle construction & working of a

helium Neon laser.

6) Explain the diff's btw homogjunction laysen and hetro junction laser.

7) Explain the function and working of a carbon-di-oxide laser.

8) Define acceptance angle of the fibre & numerical aperture of the fibre, derive expressions for them.

9) Explain how optical fibre is constructed & what is the basic principle of an optical fibre.

10) Explain the functioning of optical communication system.

11) Give the classification of optical fiber and explain how light is propagated through them.

chapter - VIII

1) Define reverbaration & reverbaration time of an hall..

2) Deduce sambines formula for reverberation time.

2) Mection the basic requirements of ~~Acco~~ Acoustically good hall.

3) Define Acoustics quiting explain different methods of acoustic quitting.

4) ~~watat~~ What are muflers, explain them in detail.

5) What is nanotechnology & nano materials explain them.

6) write a brief note on top down process & bottom up process.

7) Explain the chemical vapour deposition ~~mactd~~ method (LBD) of fabricating nano materials.

8) Explain the experimental techinques of pulsed laser vapour deposition (PVD)

9) Describe the solgel techriaue of producing high purity nano structures.

10) Explain the following characters of nano materials i) x-ray diffaction (XRD)
ii) Transmission election micros.