- ☐ Distribution of n-particles in two boxes of equal size (1.22)
- ☐ $S = k \log W$. (Boltzmann's relation)
- ☐ Tabular form of distribution [3 particles in 2 boxes | 4 particle in 2 boxes]
- ☐ Combination possessing maximum probability
- ☐ Micro & Macrostate, thermodynamic probability
- ☐ Cond^n of equillibrium b/w two system in thermal contact (β-parameter)
- ☐ Deviation from the state of Max. probability $P_x = P_{maxi}\, x^{-nf^2/2}$
- ☐ n Coin tossed together the P(getting head) = $\frac{n!}{r!(n-r)!} \times \frac{1}{2^n}$
- ☐ n-particles distributed in 2 boxes of equal size
- ☐ Stirling's approximation
- ☐ Constraints and accessible state of system
- ☐ Postulates of statistical Physics
- ☐ Equally prior probability and its significance.
- ☐ Expression for the probability of a macrostate which deviates by a small amt from most probable macrostate.
- ☐ Numericals
- ☐ Binomial th'm of probability

- ☐ M.B. Statistics & Expression $n(p)dp = 4\pi n \left(\frac{\beta}{2\pi m}\right)^{3/2} p\, e^{-\frac{\beta p^2}{2m}} dp$.
- ☐ Phase space & expression for number of cell in phase space $g(p)dp = V \times \frac{4}{3} \frac{\pi p^2 dp}{h_0^3}$
- ☐ r.m.s., Average speed, root mean → Numericals
- ☐ Elementry volume of cell in phase space for quantum cannot be zero.
- ☐ M.B. Law of energy Distribution $n_i = g_i e^{-\alpha} e^{-\beta u_i}$
- ☐ Expression for Root mean square velocity for M.B. / Most probable / Average
- ☐ No. of possible arrangements of 3 particles in 3 cells in M.B. / B.E. / F.D. (2) (2)
- ☐ $d(\log W) - \Sigma(\alpha + \beta u_i) dn_i = 0$
- ☐ States MB / BE & FD statistics # Classical & Quantum statistics
- ☐ Maxwell distribution of speed with graph.
- ☐ $P(v)dv = \frac{4}{\sqrt{\pi}} \left(\frac{m}{2kT}\right)^{3/2} v^2 e^{-\frac{mv^2}{2kT}} dv$
- ☐ Bosons & Fermions.

- Assumption of B.E. statistics & $n_i = \frac{g_i}{e^{\alpha+\beta u_i}-1}$
- e^- gas? Expression for fermi energy of electrons in metal using F.D.
- Assumption of fermi-Dirac & $n_i = \frac{g_i}{e^{\alpha} e^{u_i/kT}+1}$
- M.B. distribution is limiting of B.E.
- B.E. Condensation. & $n_0 = n\left[1-\left(\frac{T}{T_0}\right)^{3/2}\right]$ for $T<T_0$
- Plank's law for blackbody radiation. $E(\lambda)\,d\lambda = \frac{8\pi hc}{\lambda^5}\frac{d\lambda}{e^{hc/\lambda kT}-1}$
- Einstein's theory of specific heat $C_V = 3Nk_B \frac{e^{\theta_E/T}}{(e^{\theta_E/T})^2}\left(\frac{\theta_E}{T}\right)^2 = 3Nk_B\left(\frac{\theta_E}{T}\right)^2 e^{-\theta_E}$
  IVth unit
- Diff. b/w Bosons & Fermions
- Fermigas & Expression for the energy of fermigas at absolute zero.
- Degenerate gas

- Einstein theory of specific heat of solids → succes & shortcoming
- Debye temp & Debye funx^n. → Prove $E \propto T^4$
- Dulong & Petit's law
- Deby's model of specific heat of solids & T^3-Law
- Compare Debye & Einstein theories of specific heat of solid
- Phonons? Limitation of Debye model.
- Vibration modes in continuous medium.

$C_V = \frac{dQ}{n\,dt} \Rightarrow dQ = \frac{nk_BT^3}{Q^3D}\,dt$ (IIIrd)

Einstein temp = ?

——— frequency. = ?