Important Questions for Semester End Examination - Physics

Modern Physics

Deduction of Planck's law to WL and RJ law

HUP and application(electron cannot be inside the nucleus)

Quantum Mechanics

Time independent SW equation

Lasers

Einstein co-efficients(derivation)

$CO_2$ Lasers

Semiconductor laser

Optical Fibres

Numerical aperture(derivation), types

Point to Point Communication

Mechanics

Relation between the constants

Relation between shearing stress, compression strain and elongation strain

Moment of bending(Rectangular)[not much important than the two mentioned in the above]

Oscillations and Waves

Differital form of SHM

Analytical treatment of Free Vibrations

Electromagnetic Theory

Maxwell's 1,2,3 Equations

Isotropic medium equation

Gauss Theorem Differential form

Semiconductors

Electron concentration(derivation)

Prove Eg=Ef/2

Thin Films and Devices

Stges of film coating and vaccum deposition method

Nanoscience

Top Down-Bottom Up

Sol gel and ball milling methods

Carbon nanotubes and it's properties

Density of states(diagram +explanation) for 0,1,2 & 3D

Lasers: ① Explain the terms: 1) Induced absorption
2) Spⁿ Emission
3) Stimulated Emission

② Einstein coefficients (derivation)

③ $CO_2$ lasers (construction, Energy level dia. working)

④ Semiconductor laser (const + dia + Explⁿ)

⑤ Laser cutting, drilling welding.

Optical fiber: ① derivation + dia → $\sin\theta = \frac{\sqrt{n_1^2 - n_2^2}}{n_0}$

↳ Condⁿ for way propogation.

② Types of optical fibers:

③ Point-to-point communication.

Elasticity: ① Defⁿ & Explⁿ of terms: stress, strain, Hook's law

② Relⁿ: ① Y, n & σ ② Y K & σ
③ K, Y, n ④ K, n, σ

③ Relⁿ between shearing strain, elongation strain & compression strain.

④ Moment of bending beam →

$\frac{Y}{R} \times I_g$ ↑ $I_g \rightarrow \frac{bd^3}{12}$ (rectangular beam)

E.M. Theory: ① Continuity Eqn
② Circuital law
③ Maxwell's 1, 2, 3 Equation (diff + Integ)
④ Maxwell's (Isotropic dielectric medium)
⑤ Gauss's divergence theorem

Waves & Oscillations:
① Reln between f & T, ω & T
② Terms: amplitude, Frequency, period
③ Differential Eqn of SHM
④ Characteristics of SHM
⑤ Analytical treatment of SHM
2 cases.

Thin films & Nano: ① Top to down & bottom up
② Sol-gel & Ball milling
③ Types of Carbon nanotubes (zig zag, Arm chair, chiral)
④ Properties of carbon nanotubes
⑤ Applications of carbon nanotubes

Thin films: ① stages of thin film growth (block diagram)
② Block dia + Expln of vacuum coating Unit.

① What is a black body? Characteristics of emission spetrum.

② Reduction of Planck's law to Wein's & R-J law.

③ State & Explain Heisenberg Uncertainty principle.

④ Poove the Electrons can not exist inside the Nucleus.

⑤ Time Independent Schrodinger wave Eqn

⑥ Eigen values & Eigen Equations for a particle in a box.