B.Sc. sem-III Paper no. 201

Physics Assignment Questions for unit test – II

UNIT – 1

Chapter :– X – Ray diffraction by crystals

1. Give information about radiation used for the study of X – Ray diffraction by crystals.
2. Give Bragg's condition.
3. Describe Laue's Experiment.
4. Describe powder's method to determine crystal structure by X–Ray diffraction by crystals.

Chapter - Crystal Binding

1. Give properties of Inert gas crystals at absolute zero temperature.
2. Write short note on cohesive energy.
3. Explain Vander Waal's London interactions and derive formula of potential energy [$U(R) = -C/R^6$] arising due to interaction between two atoms of inert gas crystals.
4. Derive formula for total potential energy [$U(R) = -4N\varepsilon$ (2.15)] for inert gas crystals.
5. Derive equation of state for solids also obtain formula of Bulk modulus and compressibility.
6. Write short note on Ionic Crystals.
7. Write short note on Covalent Crystals.
8. Write short note on Metal Crystals.
9. Write short note on Hydrogen bond.

UNIT - 2

Chapter: CE Transistor Amplifiers

Q: Explain CE amplifier circuit. Discuss DC load line, Q-point and AC load line representation on output characteristics curves. Define DC input resistance (R_{in}), Current gain (A_i), Voltage gain (A_v) and Power gain (A_p).

Q: Prove that the efficiency of class-A amplifier is 25%.

Q: Compare CE and CB amplifier circuits.

Chapter: Solid State Electronics Devices

Q: Write a note on Zener diode. OR Explain construction, characteristics and application of Zener Diode. OR Explain Zener diode characteristics and its application as a 'Regulator'.

Q: Write a note on Tunnel diode. OR Explain construction, characteristics and application of Tunnel Diode.

Short Questions:
What is an amplifier?
Define efficiency of amplifier.
What is Zener Effect?
Why it named UJT?

Draw symbol of Zener diode.
Draw symbol of Tunnel diode.
Draw symbol of SCR.
Draw symbol of UJT.

UNIT – 3

Schodinger Eqaution and stationary states.

1. Explain the box normalized wave function on the box with length, breadth and height L of the wave function .
2. Explain conservation of probability and show that probability P and probability current density S satisfy continuity equation $\frac{dP}{dx} + divS = 0$. What is physical signification of this equation in quantum mechanics.
3. What is Compton effect? Obtain the following expression for the wave length scattered radiation in Compton effect $\lambda = \lambda_0 + \frac{h}{m_0 c}(1 - \cos\theta)$
4. Give defect of Bohr model.
5. Explain Frank- Hertz experiment.
6. Write limitation of Sommer field-Wilson model
7. What is Compton effect? Obtain the following expression for the frequency scattered radiation in Compton effect $\lambda = \lambda_0 + \frac{h}{m_0 c}(1 - \cos\theta)$
8. A mass of particale is 200μg moving with speed of 200 $\frac{km}{h}$ Calculate De Broglie's wave length.
9. In Compton effect, calculate the wave length X-Ray when incident beam of wave length 2A scattered by an angle 60

UNIT – 4Chapter –Fraunhofer diffraction.

1. Show how a plane diffraction grating is prepared?
2. What is grating spectra?
3. Explain the experimental arrangement to obtain the wave length of light.
4. Write short note on oblique incidence.
5. Dispersive power of grating.

Chapter – Resolving Power of Optical Instruments.

1. Whay is Resolving power? Obtain the derivation of resolving power of a plane diffraction grating.
2. Obtain the equation of resolving power of telescope.
3. Explain in detail Resolving Power of Optical Instruments.
4. Explain in detail resolution limit and Rayleigh's criteria.
5. Give the relation between magnifying power and the resolving power of telescope.\

6. Discuss comparison of prism and grating spectra.
7. Explain the difference between resolving power and dispersive power of telescope.