

(DPHY21)

ASSIGNMENT-1

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

PHYSICS

Second Year

Electromagnetic Theory and Modern Optics

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** a) Explain the achievement of polarization by reflection and refraction.
b) Obtain an expression for transmission coefficients.
- Q2)** a) Write a note on total internal reflection.
b) Explain the absorption of EM waves propagated obliquely to conducting medium.
- Q3)** a) Explain different properties of Laser light.
b) Obtain relation between Einstein coefficients.
- Q4)** a) Write a note on Laser pumping.
b) Explain line and Doppler broadening mechanisms.
- Q5)** a) Discuss the attainment of population inversion.
b) Describe the working of CO₂ laser

(DPHY21)

ASSIGNMENT-2

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

PHYSICS

Second Year

Electromagnetic Theory and Modern Optics

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** a) Write a note on source coherences and stability in hologram.
b) Explain the basic theory of holography.
- Q2)** a) Write a note on fiber types, rays and modes.
b) Explain ray optics representation in step irdey fibers.
- Q4)** a) What is numerical operatives? Explain signal degredation in graded index fibers.
b) Explain the mechanical properties of fibers.
- Q5)** Write any Two of the following :
- a) Total internal reflection in optical fiber.
 - b) Charge of phase on reflection in EM theory of light.
 - c) Absorption and emission process in Lasers.
 - d) Recording and resolution of hologram.

(DPHY22)

ASSIGNMENT-1

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

Second Year

Physics

Nuclear, Physics, Molecular & Resonance Spectroscopy

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** a) Explain mass defect and binding of nucleus.
b) Define nuclear force and explain its characteristics.
- Q2)** a) Explain Proton – proton and neutron – proton scattering.
b) Briefly explain the Meson theory of Nuclear forces.
- Q3)** a) Obtain semi – empirical mass formula.
b) Obtain Q – equation and explain its significance.
- Q4)** a) Explain Fermi's theory of β – decay.
b) Write a note on nuclear isomerism.

(DPHY22)

ASSIGNMENT-2

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

Second Year

Physics

Nuclear, Physics, Molecular & Resonance Spectroscopy

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** a) Explain spin – lattice and spin – spin relaxation mechanism.
b) Briefly explain the working of NMR spectrometer.
- Q2)** a) Explain the characteristics of A and g values in ESR.
b) Describe briefly the working of NQR spectrometer.
- Q3)** a) Explain different types of molecules.
b) Explain the rotational spectra of Rigid rotation.
- Q4)** a) Obtain an expression for vibrational energy of diatomic molecules.
b) Briefly explain IR spectroscopy.
- Q5)** Write a note on any Two of the following.
a) Magic numbers
b) Conservation laws among the elementary particles.
c) ESR spectrometer
d) PQR branches



(DPHY23)

ASSIGNMENT-1

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

PHYSICS

Second Year

Solid State Physics - I

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** a) What are symmetry operations? Explain the meaning of a 'n' fold rotation axis and n – fold screw axis.
b) Explain different point groups and space groups in a crystal lattice.
- Q2)** a) Explain the Laue's interpretation of x – ray diffraction in crystals.
b) Explain the determination of lattice constants.
- Q3)** a) Define cohesive energy and explain the cohesive energy.
b) Explain the ball and spring model of a harmonic crystal.
- Q4)** a) Explain the normal modes of a one dimensional diatomic chain.
b) Explain the phonon dispersion by inelastic Neutron scattering.
- Q5)** a) Give the assumptions of classical theory of lattice specific heat.
b) Explain quantum theory of heat capacity.

(DPHY23)

ASSIGNMENT-2

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

PHYSICS

Second Year

Solid State Physics - I

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** Discuss in detail the Kronig – penny model for the motion of electron in a periodic potential.
- Q2)** a) Explain the nearly free electron model.
b) Obtain an expression for carrier density in extrinsic semiconductor.
- Q3)** a) State and explain Hall effect.
b) Explain thermoelectric effect.
- Q4)** Write a notes on any Two of the following :
- a) Bragg's law
 - b) Quantization of Lattice vibrations
 - c) An harmonic effects.
 - d) General features of extrinsic semiconductors.



(DPHY24)

ASSIGNMENT-1

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

Second Year

PHYSICS

Solid State Physics II

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** Explain what is meant by polarization in solid dielectric. Arrive at the relation between the dielectric constant and atomic polarizability.
- Q2)** Give the classification of representative ferroelectric materials and explain the theory of the ferroelectric displacive transitions.
- Q3)** What is meant by point defects in crystal lattice? Explain different types of point defects with suitable examples.
- Q4)** Distinguish between paramagnetism and diamagnetism and explain the quantum theory of magnetic susceptibility.

(DPHY24)

ASSIGNMENT-2

M.Sc. (Second) DEGREE EXAMINATION, MAY – 2018

Second Year

PHYSICS

Solid State Physics II

MAXIMUM MARKS:30

Answer ALL Questions

- Q1)** Explain the Heissenberg's exchange interaction in ferromagnetism and discuss the ferro magnetic domains.
- Q2)** Give an account of Neel's theory of artiferromagnetism and explain spin waves.
- Q3)** Define super conductivity and explain what is energy gap in super conductors. Discuss the observation and dependence of preparation on energy gap in superconductors.
- Q4)** Explain the BCS Theory of super conductors and discuss the imparliart predictors of the BCS theory.
- Q5)** Write a note on Two of the following :
- a) Ferroelectric domains
 - b) Adiabatic demagnetization
 - c) GMR – CMR materials
 - d) High Temperature super conductors.

