

M. sc Physics I Semester
Examination December, 2020-21

Classical Mechanics

Paper: II

Note : Attempt all the questions.

Q.1 Explain basic conservation laws related with classical mechanics.

Q.2 Explain Kepler problem.

Q.3 Discuss normal coordinates and normal modes of vibration.

Q.4 Write down Different symmetries and associated conservation laws.

Q.5 Write notes on any two of the following:

- i) Equation of motion and first integral
- ii) Poisson's bracket
- iii) Eigen frequency and general motion
- iv) Difference between Galilean and Lorentz transformation.

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Electronic devices

Paper: iv

Note : Attempt all the questions

Q.1 Explain working of MOSFET.

Q.2 Explain construction and working of photo- detector .

Q.3 Differentiate between electrostrictive and magnetostrictive effects.

Q.4 What is Piezo- electric effect? Explain the working of piezo- electric resonators and filters.

Q.5 Write short note on the following.

a) Solar cell

b) Gunn Diode

c) Optical Storage Devis

d) Acoustic Wave Devices

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Physics

Quantum Mechanics –I

Paper-III

- Q.1** Discuss the conditions under which the principles of quantum mechanics hold.
- Q.2** Explain the various quantum numbers for hydrogen atom.
- Q.3** Derive Schrödinger's wave equation for the hydrogen atom
- Q.4** Deduce the commutation relation for the components L_x, L_y, L_z , of the orbital angular momentum and show that all the three components commute with $L^2 = L_x^2 + L_y^2 + L_z^2$
- Q5** Write short notes on any two of the following
Eigen function of L^2 in term of spherical harmonies.
- A-** Low energy nuclear states.

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Physics

MATHEMATICAL PHYSICS

Paper-I

- Q.1** What do you think about generating function for Bessel's differential equation?
- Q.2** State and explain convolution theorem.
- Q.3** what do you mean about Green's function for one dimensional problem. Explain quantum mechanical scattering problem.
- Q.4** State and prove Cauchy's residue theorem.
- Q5** Write short notes on:
A-Laurent series and mapping
B-Spherical co-ordinate system