Assignment Questions
Paper 301

Unit 3 (Lagrangian formulation)

- State D'Alembert's principle and obtain Lagrangian equation of motion for a conservative holonomic system.
- Obtain the expression for kinetic energy in case of double pendulum using generalized coordinates.
- Find the acceleration in case of a spherical pendulum and prove that its angular momentum is a constant.
- Discuss velocity dependent potential in detail.
- Derive Euler's equation of motion and prove that $\omega.N = \frac{dT}{dt}$.
- Define Spherical top, Symmetric top, Asymmetric top and rigid rotor.
- State Euler's theorem.
- and Chasles' theorem.

Unit-01

(01) Separate Helmholtz equation completely in spherical co-ordinate system.

(02) Separate Helmholtz equation completely in cylindrical co-ordinate system.

(03) Separate Helmholtz equation completely in cartesian co-ordinate system.

(04) Separate Laplace equation completely in spherical co-ordinate system.

(05) Separate Laplace equation completely in cylindrical co-ordinate system.

(06) Separate Laplace equation completely in cartesian co-ordinate system.

(07) Using the Schrodinger equation for a free particle Obtain Helmholtz equation

(08) Give answer in short.

(01) State Poisson's equation is given by?

(02) State Diffusion's equation is given by?

(03) State Laplace's equation is given by?

(04) State Wave's equation is given by?

(05)State two importance of mathematical physics.

(06) Can all equation be separate in any co-ordinate system? Why?