THIRD SEMESTER THEORY

FPYC-301Classical Mechanics and special theory of relativity- II (HONS)

Unit-I

Central force motion, reduction of two body central force of motion into equivalent one body motion, general features of central force motion, differential equation of orbit, Kepler's laws of planetary motion, virial theorem, Unbound motion ,Rutherford scattering Centre of mass and Laboratory co-ordinates.

UNIT-II

Motion of a system of particles:- conservation of linear momentum ,angular momentum and total energy of a system of particles, Kinematics of rigid body motion, moment of inertia-parallel axes and perpendicular axes theorem, Rotational kinetic energy and angular momentum of rigid body about a fixed axis, Torque free motion of a rigid body.

Unit-III

Stable and unstable equilibrium, small oscillation about an equilibrium configuration, review of the one dimensional problem. Normal mode analysis of couple oscillator, properties of T,V &ω forced and damped oscillator, Normal co-ordinates, parallel pendulum, double pendulum. (4)

Unit-IV

Einstein's special theory of relativity- constancy of velocity of light as a postulate, Derivation of Lorentz transformation , Length contraction and time dilation, Mass energy relation, Doppler shift, Minkowski space-time diagram, 4-D space time continuum, Lorentz transformation as coordinate transformation.

REFERENCE:

1. Classical mechanics-GUPTA, KUMAR, SHARMA (Pragati prakashan)
2. Classical mechanics- H.Goldstein
3. Classical mechanics-J.C UPADHYA
4. Classical mechanics-Rana and Jog
5. Classical mechanics-Simon
6. Classical mechanics-Gupta, satyaprakash