3-1-117

Subject: PHYSICS

SEMESTER- I

Paper I: Mechanics & Properties of Matter
(For Non-Mathematics Combinations)

UNIT -I

1. Mathematical Background:

Scalars and vectors -vector addition-scalar and vector products of vector and their physical significance-vector calculus-gradient of a scalar point function-divergence and curl of vector-statements of stokes and Gauss theorems -examples (no derivations).

2.Motion of system :

Collisions- Elastic and inelastic collisions-Collisions in one and two dimension-Rocket propulsion-Center of mass-Motion of the centre of mass-Impact parameter-Scattering crosssection, Rutherford scattering (No derivation-Qualitative ideas only)

UNIT II

3. Mechanics of Rigid body:

Rotational kinetic energy and moment of inertia -Calculating the moment of inertia in simple cases (Rod, disc, sphere and cylinder)-parallel & Perpendicular axes theoremsTorque-relation between torque and angular momentum.

Angular momentum of a particle-Torque and angular momentum for a system of particles- conservation of angular momentum-Translation and rotational motion of system-Elementary ideas about gyroscopic motion (No derivation -discussion of results)-precission of the equinoxes

UNIT-III

4.Central forces

Central force- Def & examples- General properties of central forces-Conservative nature of central forces, Planetary motion-Kepler's laws (Statements & Explanation), Newton's law of gravitation from Kepler's law, Geostationary Satellite Motion.

UNIT-IV

5. Fluid Flow

The flow of ideal fluids-Equation of continuity -Bernoulli's equation-Torricelli's theorem-The venture meter-Pitot's tube-Viscosity and the flow of real fluids- Poisellious equation.

UNIT V

6. Relativistic effects

Moving reference frames-Inertial reference frames-Galilean relativity (Elementary treatment only, application to be covered)-Special theory of relativity-Statements of the two basic postulates-Lorentz transformation equations-length contraction-time dilation-addition of velocities-Momentum and relativistic mass- Mass -Energy equation, rest mass & momentum of a particle.

Signature of the
Chairman (B.O.S.)
(20.....Exams)

3-1-117

~~3-1-117~~

Reference Books :

1. BSc Physics -Telugu Akademy, Hyderabad
2. Properties of Matter - D.S. Mathur, *S.Chand & Co, New Delhi ,11th Edn., 2000*
3. Properties of Matter - Brijlal& Subrmanyam ,*S.Chand &Co. 1982*
4. Physics for Biology and Premedical Students -D.N. Burns & SGG Mac Donald
5. Unified Physics Vol.I Mechanics,Waves and Oscillations - *Jai Prakash Nath & Co.Ltd., Meerut.*

*****

Signature of the
Chairman (B.O.S.)
(20.....Exams)