1.9 10009 ENGINEERING MECHANICS

UNIT-1 FORCE SYSTEM

- Definition
- Units
- Different Types of Forces

UNIT-2 COPLANAR FORCES

- Resolution Forces
- Law of Parallelogram of Forces
- Resultant of Two or more forces
- Basic Conditions of Equilibrium
- Lami's Theorem
- Jib Crane
- Law of Polygon of Forces

UNIT-3 FRICTION

- Type of Friction
- Law of Friction
- Angle of Friction
- Angle of Repose
- Friction on Horizontal and Inclined Plans

UNIT-4 CENTRE OF GRAVITY

- Concept
- Centroid
- Calculation of C.G. of Regular Bodies
- Calculation of C.G. of plain Geometrical Figures

UNIT-5 MOMENT

- Definition, Units & Sign Convention
- Principle of Movement
- Application of Equilibrium Conditions for non-concurrent Forces

UNIT-6 APPLICATION OF FORCES & MOVEMENTS

- Levers & their types
- Reaction of Simply Support Beams (Graphical & Analytical Method)
- Steel Yard
- Leaver Safety Valve
- Foundry Crane

UNIT-7 NEWTON'S LAW OF MOTION

- Definitions
- Momentum and its unit
- Application of Second law of motion

UNIT-8 IMPACT OF COLLISION CONCEPT

- Impulse & Impulsive Force
- Law of Conservation & Momentum
- Collision between two rigid bodies
- Newton's Experimental law of collision, coefficient of Restitution

UNIT-9 WORK POWER & ENERGY

- Work done by constant force
- Work done by uniform variable force
- Power
- Indicated Power
- Brake Power
- Efficiency
- Power required for an Engine on Horizontal and Inclined (Smooth & Rough) Planes.
- Energy
- Potential Energy
- Kinetic Energy of Rectilinear Motion
- Kinetic Energy of Circular Motion

UNIT-10 SIMPLE STRESS AND STRAIN

- Introduction
- Stress
- Strain
- Tensile
- Compressive and shear stresses and strains
- Elastic Limit
- Hook's Law

UNIT-11 PURE BENDING OF BEAMS

- Introduction
- Simple bending theory of sample bending
- Assumptions
- Bending Stresses
- Moment of Resistance
- Section Modules
- Stress in beams of different cross sections

UNIT-12 TORSION

- Introduction
- Torsion of Shafts of Circular Section Torque and Twist
- Shear Stress due to torque
- Power Transmitted by shaft (Hollow and Solid)

Reference Book: Engineering Mechanics by Dr. K.S. Yadav