

INSTRUCTIONS TO PAPER SETTERS	Maximum Marks : 75
3. Question No.1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
4. Apart from question No.1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only one question from each unit.	

UNIT I

Introduction: Fluid properties, Ideal and real fluids, Concept of viscosity, surface tension and compressibility; thermodynamic properties.

Fluid statics: Fluid pressure and its measurement, types of manometers, Total pressure and centre of pressure, Evaluation of pressure force on dams, lock gates, curved surfaces, pressure distribution in liquid subjected to constant horizontal/vertical acceleration, principles of equilibrium, buoyancy, centre of buoyancy, meta centre, stability conditions of floating and submerged bodies, Experimental and analytical method of determination of metacentric height.

[No. of Hours: 9]

UNIT II

Fluid kinematics : Variation of flow parameters in space and time, Lagrangian and Eulerian concepts in fluid motion, Types of fluid flow: steady and unsteady, uniform and non uniform, rotational and irrotational, Laminar and tubular; one, two and three dimensional flow, streamline, pathline and streakline, Continuity equation in Cartesian and polar co-ordinates and its applications, Velocity potential and stream function, flownet, Types of motion: Linear translation, Linear deformation, Angular deformation, Rotation, Vorticity, Vortex flow.

[No. of Hours: 11]

UNIT III

Fluid dynamics : Reynolds's, Navier-Stokes and Euler's equations of motion, Derivation of Bernoulli's equation from Euler's equation and its limitations, Applications of Bernoulli's equations-Orifice, Venturimeter, Mouth piece, Weir & notch, Pitot's tube, Siphon, etc; hydraulic gradient and total energy lines and their Engineering significance.

[No. of Hours: 10]

UNIT IV

Momentum equation, Moment of momentum equation- Assumptions and limitations, applications, impact of jets and forces in bends.

Dimensional and Model analysis : Dimensional homogeneity, methods of dimensional analysis, Buckingham's π theorem, selection of Repeating variables, Forces acting on moving fluid, Dimensionless numbers and their Engineering significance, Model analysis, Geometric, Kinematic and Dynamic similarity, Model testing of partially submerged bodies, scale ratios for distorted models.

[No. of Hours: 10]

Suggested Reading:

1. Fluid Mechanics, Victor Streeter, International Edition, The Mc Graw Hill Publications
2. Fluid Mechanics through Problems, R.J. Garde, New Age Publications.
3. Fluid Mechanics and its Application, Vijay Gupta, Santosh K Gupta, New Age Publications
4. Fluid Mechanics, Hughes & Brighton, Tata Mc Graw Hill.
5. Mechanics of Fluids, Shames, McGraw Hill.
6. Fluid Mechanics, Neville, Pearson Education
7. Introduction to Fluid Mechanics, A. James, Fay, PHI Publications.
8. Fluid Mechanics, R.K. Bansal
9. Fluid Mechanics, Modi and Seth
10. Fluid Mechanics, A.K. Jain.