Written by Administrator Friday, 23 October 2009 11:23 - Last Updated Friday, 23 October 2009 11:29

Sub Code	
:	
06 CV 35	
IA Marks	
:	
25	
Hrs/ Week	
:	
04	

Exam Hours

:

03

Total Hrs.

:

52

Exam Marks

:

100

PART – A

UNIT 1:

1.1 Scope and importance of Subject, 1.2 Definition of Fluid, Distinction between solids & fluid,1.3 Distinction between liquid & gas fluid continuum.

FLUID PROPERTIES AND CLASSIFICATION OF FLUID

1.4 Mass density, Specific Volume, 1.5 Specific Weight Relative density, 1.6 Definition, units and Dimensions, 1.7 Viscosity, Newton's law of viscosity, 1.8 Newtonian and Non-Newtonian Fluids, 1.9 Ideal and Real fluids, 1.10 Compressibility, 1.11 Vapour pressure, 1.12 surface tension, Definitions, units and dimensions, 1.13 Equation for stability of bubble, 1.14 Capillarity, theory and problems, 1.15 Problems on Newton's law of viscosity.

9 Hours

UNIT 2:

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FLUID PRESSURE AND ITS MEASUREMENT

1.1 Definition of pressure, units and dimensions, 2.2 Pressure at a point, 2.3 Pascal's law, 2.4 Hydrostatic pressure law, 2.5 Absolute and Gauge pressure, 2.6 Measurement of pressure, Simple Manometer theory and problems, 2.7 Differential manometer theory & Problems, 2.8 Mechanical pressure gauges.

6 Hours

UNIT-III

HYDROSTATICS

1.1 Definition of total pressure, Center of pressure, Centroid, centroidal depth, depth of center of pressure, 3.2 Equation for hydrostatic force and depth of center of pressure on plane surfaces (vertical and inclined), 3.3 Problems on hydrostatic force vertically submerged surfaces 3.4 Problems on inclined submerged surfaces, 3.5 Hydrostatic force on submerged curved surfaces, problems, 3.6 Pressure diagram, problems

6 Hours

UNIT 4:

KINEMATICS OF FLUIDS

1.1 Description of fluid flow, 4.2 Lagrangian and Eulerian approaches. 4.3 Classification of flow, steady & unsteady, uniform and non-uniform, 4.4 Definition of path line, streamline, streak line, stream tube, one, two, three dimensional flows. Rotational and irrotational flow, 4.5 Acceleration of flow, 4.6 One dimensional flow, derivation of continuity equation in differential form, 4.7 Definition of velocity potential, stream functions, stream line,

equipotential line, 4.8 Relation between

velocity potential and stream function, Laplace equation.

4.9 Problem on continuity equation, 4.10 Problem on velocity potential and stream function.

7 Hours

PART – B

UNIT 5: DYNAMICS OF FLUID FLOW

5.1 Concept of Inertia force and other forces causing motion, 5.2 Derivation of Euler's equation and Bernoulli's

equation with assumption and limitation. 5.3

Modification of Bernoulli's equation, problem on Bernoulli's equation without and with losses. 5.4 Application of Bernoulli's equation - Pitot tube, problems 5.5 Venturimeter, problems. 5.6 Momentum

equation, problems

7 Hours

UNIT 6:

FLOW THROUGH PIPES

6.1 Flow through pipes, Reynolds number, classification of flow, 6.2 Definition of hydraulic gradient, energy gradient., 6.3 Major and minor losses in pipe flow, 6.4 Equation for head loss due to friction (Darcy-Weishbach equation). –Friction factor for commercial pipes, 6.5 Minor losses (types), equation for head loss due to sudden expansion. – Problem on minor losses 6.6 Pipes in series, pipes in parallel and equivalent pipe, 6.6 Problems.

7 Hours

UNIT 7:

FLOW MEASUREMENTS

7.1 Flow through Orifices; classification, 7.2 Hydraulic co-efficients of an Orifice and relation between them. 7.3 Equation for co-efficient of velocity, problems, 7.4 Submerged and large rectangular Orifices, 7.5 Flow through mouth pieces, classification, equation for discharge and pressure head for an external cylindrical mouth piece.

5 Hours

UNIT 8:

FLOW MEASUREMENTS ...

8.1 Flow over notches, classification, 8.2 Equation for discharge over rectangular and trapezoidal notches, 8.3 Equation for discharge over V-notch, problems, 8.4 Cippoletti notch, problems. 8.5. Types of Nappe, ventilation of weirs, 8.6 Broad crested weirs, problems, 8.7.Submerged weirs, equation for discharge, problems.

5 Hours

TEXT BOOKS :

1. **Hydraulics and Fluid Mechanics** by P.N. Modi and S.M. Seth Standard Book House, New Delhi.

2. Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, L akshmi

Publications, New Delhi.

3. "Fluid Mechanics", Jain, A.K., Khanna Publishers, New Delhi.

REFERENCE BOOKS :

1. **Elementary Hydraulics (1st Edition)** James F Cruise, Vijay P. Singh, Mohsan M. Sherif, Thomson Learning.

2. **Fluid Mechanics, Hydraulic and Hydraulics** by K.R. Arora, Standard Book House, New Delhi.

3. **Fluid Mechanics,** John F. Douglas et al., Pearson Education, India.