

AMEV09 APPLIED HYDRAULICS AND FLUID MACHINES

UNIT-1 UNIFORM FLOW

- 1.1 Properties of open channel
- 1.2 Types of flow - Uniform flow- Chezy's and Manning's equations
- 1.3 Determination of roughness coefficients- hydraulically best sections
- 1.4 Specific energy- critical depth- Uniform flow in mild, steep and critical slopes.

UNIT-2 VARIED FLOWS

- 2.1 Dynamic equation for gradually varied flow
- 2.2 Free surface profiles in various slopes- specific force
- 2.3 Rapidly varied flow- hydraulic jump- classification
- 2.4 Unsteady flow- types of surges.

UNIT-3 MOMENTUM PRINCIPLE

- 3.1 Impulse momentum equation- Application of linear momentum principle
- 3.2 Impact of Jet- Force exerted by a jet on normal,
- 3.3 Inclined and curved surfaces for stationary and moving cases
- 3.4 Angular momentum principle- construction of velocity vector diagrams.

UNIT-4 HYDRAULIC TURBINES

- 4.1 Classification- working principles- design of Pelton wheel
- 4.2 Francis and Kaplan Turbines-Head, losses
- 4.3 Work done and efficiency- Draft tube- theory and types- similarity laws- specific speed
- 4.4 Operating characteristics- Governing of turbines- Selection of turbines.

UNIT-5 HYDRAULIC PUMPS

- 5.1 Classification- centrifugal pump- working principle- head,
- 5.2 Discharge and efficiencies- minimum starting speed- Net positive suction head
- 5.3 Performance curves- specific speed- Reciprocating pump- components and working
- 5.4 Slip- indicator diagram- air vessel- selection of pumps.

References Books

1. Ven Te Chow, "Open Channel Hydraulics", McGraw Hill, New York, 200-.
2. Rajesh Srivastava, "Flow through open channels", Oxford University Press, New Delhi, 2008.
3. Jain. A.K., "Fluid Mechanics", Khanna Publishers, Delhi, 2010.