

Assignment: 8 IMPACT OF JET AND HYDRAULIC TURBINES

1. Prove that the velocity of the vanes should be half the velocity of jet for maximum efficiency for a series of flat vanes held normal to the axis of jet.
2. Derive an expression for calculating efficiency for radial vane for jet striking a moving curved vane tangentially at one tip.
3. Show that when a jet of water impinges on a series of curved vanes maximum efficiency is obtained when the vane is semi-circular and the velocity of jet is double the velocity of vane.
4. Explain impulse momentum principle.
5. Calculate the force and work-done when jet strikes moving vertical and inclined flat plate.
6. Explain construction and working of Pelton wheel turbine. Derive an expression for maximum hydraulic efficiency of Pelton wheel.
7. Describe with sketch the working of governing system of Francis turbine.
8. State the functions of a draft tube and explain with neat sketches different types of draft tubes.
9. How are hydraulic turbines are classified?
10. State causes of cavitation in hydraulic turbine and methods of avoiding it.
11. State advantages and disadvantages of Francis turbine over Pelton wheel.

12. Sketch and describe a modern method of regulation to maintain constant speed for Pelton turbine. Explain the performance characteristics of Pelton turbine.
13. Explain construction and working of Kaplan turbine with neat sketch.
14. Explain criteria for the selection of hydraulic turbines.
15. Explain hydraulic efficiency, mechanical efficiency and overall efficiency with expression.
16. Define specific speed of a turbine and derive an expression for the same.

