

**GYANMANJARI INSTITUTE OF TECHNOLOGY**

**Semester: 4<sup>th</sup> (Electrical)**

**Subject code – 2140907**

**Sub Name: Applied Thermal and Hydraulic Engineering**

**Date:**

**ASSIGNMENT- 3**

**MODULE -4**

**Pumps:**

1. Give the classification of pump
2. Explain with a neat sketch the principle and working of centrifugal pump.
3. Explain the velocity diagram and derive an expression for work input.
4. Define: (a) Suction head (b) Delivery head and (c) Manometric head
5. Define: (a) Manometric efficiency (b) Mechanical efficiency and (c) Volumetric efficiency (d) Overall efficiency
6. What is meant by multistage pump? Explain multistage pump with impeller in series.
7. Draw and explain the characteristic curves of centrifugal pump in following cases.  
(a) Discharge Vs  $H_m$   
(b) Discharge Vs Overall efficiency
8. What is NPSH related to centrifugal pump?
9. Define cavitation and separation.
10. Explain methods of priming in brief.
11. Write the advantages of centrifugal pumps over reciprocating pump.
12. What is difference between a single acting and double acting pump?
13. What is the theoretical discharge from a single acting reciprocating pump using standard notations?
14. Define coefficient of velocity and volumetric efficiency of a reciprocating pump.
15. What is slip? When can slip be negative?
16. Show that the area of the indicator diagram of a reciprocating pump is the work done?

**Turbines:**

1. Sketch a hydro-power plant and explain its different elements.
2. Explain how hydraulic turbines are classified.
3. Differentiate clearly between Impulse turbine and Reaction turbine.
4. Explain with neat sketch, the components and working of Pelton turbine.

5. Draw the inlet and outlet velocity triangle for bucket in Pelton wheel with the meaning of the terms.
6. Define various efficiencies as applied to impulse turbine.
7. Classification of reaction turbine.
8. Draw a Francis reaction turbine and write function of its major components.
9. State function of draft tube? Why is it used in a reaction turbine and explain with neat sketch different types of draft tubes.
10. Explain work done, hydraulic efficiency, mechanical efficiency, overall efficiency, speed ratio and flow ratio.
11. Difference between impulse turbine and reaction turbine.
12. Define specific speed of a turbine and derive an expression for the same.
13. Explain characteristic curves for turbines.
14. Explain: (a) Unit speed (2) Unit discharge (3) Unit power
15. Write the performance characteristic curve of following:
  - (a) Unit speed Vs unit discharge
  - (b) Unit speed Vs unit Power
  - (c) Unit speed Vs unit efficiency
16. Define the terms Specific speed in case of a turbine.
17. Give selection criteria of a turbine at a particular location.