

Roll No. ....

**24259**

**B. Tech 5th Semester (ME)**

**Examination – December, 2014**

**FLUID MACHINE**

**Paper : ME-305-F**

**Time : Three Hours ]**

**[ Maximum Marks : 100**

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

**Note :** Attempt any *five* questions from 8 questions.

1. (a) Explain the Jet impingement on inclined plate ? 10  
(b) Describe the component of Francis turbine & also write the design parameter of it ? 10
2. An inward flow reaction turbine has external & internal wheel diameter as 1 m & 0.5 m respectively the water enters the wheel with velocity of 30 m/ sec. at an angle of  $10^\circ$ . The width of the wheel at inlet and outlet is 150m & 300 m respectively. If vane angle is  $90^\circ$  at the inlet and  $25^\circ$  at outlet, determine (i) tangential velocity of runner at inlet, (ii) Absolute velocity of water at outlet ? 20

3. Describe the impulse turbine with neat sketch also explain speed ratio, flow ratio, Jet ratio & no. of buckets? 20
4. (a) Explain the functioning of hydraulic press & hydraulic intensifier? 10  
(b) What is the principle of reciprocating pump? Also explain the volumetric efficiency and slip of it. 10
5. (a) What is the function of draft tube? Also sketch its diagram. 10  
(b) What is priming in reciprocating pump, explain slip % of it? 10
6. (a) Derive the relation for specific speed of centrifugal pump. 10  
(b) How it is different from specific speed of turbine? 10
7. A single jet impulse turbine at 300 rpm under a head of 570 m. The jet diameter 200 mm, its deflection inside the bucket is 160 degree & its relative velocity is reduce by 15% due to friction. Determine (i) water power (ii) overall force on bucket (iii) overall efficiency. 20
8. Write short notes on : 20  
(a) Euler head  
(b) Air vessel in reciprocating pump  
(c) Performance characteristics of Kaplan  
(d) Cavitation