Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards)   (Sem.–6)
FLUID MACHINERY
Subject Code :BTME-603
M.Code : 71187

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1   Answer briefly :

(a) State impulse momentum principle and write its equation.

(b) Derive the equation of work done for the jet impingement upon a moving flat inclined plate.

(c) Classify the turbines on the basis of head available.

(d) What is specific speed of turbine?

(e) What are the different forms of draft tubes?

(f) What is slip of the impeller?

(g) What is priming?

(h) Define overall efficiency of turbine.

(i) Name the various problems commonly experienced during operation of centrifugal pumps.

(j) What is Thomas Cavitation number?

SECTION-B

2. Discuss the construction and operation of fluid coupling.

3. Derive an equation for work done by the jet impingement upon a series of moving curved vanes mounted radially on a wheel.

4. An inward flow reaction turbine works under a head of 28m. The velocity of wheel periphery at inlet is 15m/s. The outlet pipe of the turbine is 30cm in diameter and the turbine is supplied with 250 litres per second of water. The radial velocity of flow through the wheel is same as velocity in outlet pipe. Determine vane angles at inlet and power of turbine.

5. Discuss in detail the working of hydraulic ram with diagram.

6. Derive an expression for specific speed of pump.

SECTION-C

7. A centrifugal pump impeller has diameter of 60 cm and width 6 cm at outlet. The pump runs at 1450 rpm and delivers 0.8 m^3/s against a head of 80m. The leakage loss after the impeller is 4% of discharge , the mechanical loss is 10 kW and the hydraulic efficiency is 80%. Determine the blade angle at outlet, the power required and overall efficiency of pump.

8. Discuss in detail with diagram the governing mechanism of francis turbine.

9. A Kaplan turbine operating under a head of 7.5m develops 1835 kW with an overall efficiency of 87%. The turbine is set 2.5 m above the tail level and vacuum gauge is inserted at turbine outlet records a suction head of 3.15 m. Calculate the efficiency of the draft tube if it has an inlet diameter of 3 m and the loss of head due to friction in the draft tube equals 25% of kinetic head at outlet.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.