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

Total No. of Questions : 09

B.Tech (ME) (Sem.–4)

FLUID MACHINES

Subject Code : BTME-402-18

M.Code : 77547

Date of Examination :13-05-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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

1. Answer briefly :

(a) What are the advantages of model testing?

(b) How will you classify turbines?

(c) Define the term negative slip in reciprocating pump.

(d) Define the terms unit power and unit speed.

(e) Differentiate between impulse and reaction turbine.

(f) Write the formula for efficiency when the series of flat vanes are mounted on wheel.

(g) Define net head in turbines.

(h) What is multistage in pumps?

(i) What is the significance of Thomas cavitation number?

(j) Define impulse-momentum equation.

SECTION-B

2. A jet of water of diameter 50mm moving with a velocity of 40m/s strikes a curved fixed symmetrical vane at the centre. Find the force exerted by the jet of water in the direction of the jet, if the jet is deflected through an angle 120 degree at the outlet of the curved vane.

3. Derive the equation of force on the curved plate when the plate is in the direction of jet.

4. Define the various efficiencies associated with hydraulic turbines.

5. Discuss the working of radial flow reaction turbine.

6. With diagram explain the working of hydraulic ram.

SECTION-C

7. A centrifugal pump rotating at 1000 rpm delivers 160 litres/s of water against a head of 30m. The pump is installed at a place where atmospheric pressure is 1×10^5 Pascal and vapour pressure of water is 3 kPa. The head loss in suction pipe is equivalent to 0.2m of water. Calculate (a) Minimum NPSH (b) Maximum allowable height of the pump from free surface of water in sump.

8. What is an air vessel? Describe the function of air vessels for reciprocating pumps.

9. Discuss in detail the working of hydraulic coupling.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.