

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 : 05-06-2023**

**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. Write briefly :**

- a) Differentiate between turbine and pump.
- b) Define the term suction head and delivery head with diagram
- c) Define the term slip in reciprocating pump.
- d) Name the different types of draft tubes used in the turbines?
- e) Define specific speed of turbine.
- f) Differentiate between impulse and reaction turbine.
- g) Write the formula for efficiency when the vanes are curved radial.
- h) What is the difference between net head and gross head in turbines?
- i) What is the significance of Thomas cavitation number?
- j) What is gear wheel pump?

## SECTION-B

2. A jet of water of diameter 75mm moving with a velocity of 30m/s strikes a curved fixed vane at one end at an angle of 30 degree to horizontal. The jet leaves the plate at an angle of 20 degree to the horizontal. Find the force exerted by the jet on the plate in the horizontal and vertical directions.
3. Derive the equation of force on the curved plate when the plate is moving in the direction of jet.
4. Discuss the general layout of hydraulic power plant.
5. Discuss the working of axial flow reaction turbine.
6. With diagram explain the working of hydraulic press.

## 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  $1 \times 10^5$  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. Derive the equation of work-done by double-acting reciprocating pump.
9. Discuss in detail the working of torque converter.

**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.**