

Roll No.

Total No. of Pages : 02

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**B.Tech.(ME) (Sem-6)**  
**FLUID MACHINERY**  
**Subject Code : BTME-603**  
**M.Code : 71187**  
**Date of Examination : 15-06-2023**

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**

**1. Answer briefly :**

- a) What do you know about Impulse momentum principle?
- b) List different components of Pelton turbine.
- c) What is the function of draft tube?
- d) What do you mean by priming of centrifugal pumps?
- e) What is the significance of model relationships?
- f) What is Net positive Suction Head?
- g) What are the functions of air vessels?
- h) What is the difference between simple and differential accumulator?
- i) How the efficiency of hydraulic ram is calculated?
- j) What is the function of surge tank?

## SECTION-B

2. A nozzle of 5 cm diameter delivers a stream of water 20 m/s perpendicular to a plate that moves away from the jet at m/s. Find the force on the plate, the work done and efficiency of jet.
3. A turbine develops 9000KW when running at 10 r.p.m. The head on the turbine is 30 m. If the head on turbine is reduced to 18 m, determine the speed and power developed by the turbine.
4. The diameters of an impeller of a centrifugal pump at inlet and outlet are 20 cm and 40 cm respectively. Determine the minimum speed for starting the pump if it works against a head of 25 m.
5. A single acting reciprocating pump running at 30 r.p.m., delivers  $0.012 \text{ m}^3/\text{s}$  of water. The diameter of the piston is 25 cm and stroke length is 50 cm. Determine its theoretical discharge of the pump.
6. The diameter of the fixed ram and fixed cylinder of an intensifier are 100 mm and 250 mm respectively. If the pressure of the water supplied to the fixed cylinder is  $25 \text{ N/cm}^2$ , find the pressure of the water flowing through the fixed ram.

## SECTION-C

7. What is the difference between fluid coupling and torque converter? Explain the torque converter with a neat sketch.
8. Find the rise in pressure in the impeller of centrifugal pump through which water is flowing at the rate of 15 liters/s. The internal and external diameters of the impeller are 20 cm and 40 cm respectively. The widths of impeller at inlet and outlet are 1.6 cm and 0.8 cm. The pump is running at 1200 r.p.m. The water enters the impeller radially at inlet and impeller vane angle at outlet is  $30^\circ$ . Neglect losses through the impeller.
9. A Pelton wheel is supplied with water under a head of 35 m at the rate of 40.5 kilo liter/min. The bucket deflects the jet through an angle of  $160^\circ$  and the mean bucket speed is 13 m/s. Calculate the power and hydraulic efficiency of the turbine.

**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.**