

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V (OLD) EXAMINATION – WINTER 2018****Subject Code:151903****Date: 16/11/2018****Subject Name: Fluid Power Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain jet propulsion of a tank with an orifice. **07**  
(b) Describe working function, principle, construction and working of hydraulic press with neat sketch. **07**
- Q.2** (a) Derive expression of forces in X and Y direction for jet strikes on the symmetrical curved plate at the center. **07**  
(b) Water is flowing through a pipe at the end of which a nozzle is fitted. The diameter of the nozzle is 120 mm and the head of water at the center nozzle is 80 m. Find the force exerted by the jet of water on a fixed vertical plate. The coefficient of velocity is given as 0.96. Also calculate the work done. **07**
- OR**
- (b) A jet of water from a nozzle is deflected through  $60^\circ$  angle from its original direction by a curved plate which it enters without shock with a velocity of 30 m/s. If the discharge from the nozzle is 1 Kg/s, calculate the magnitude and direction of the resultant force on the vane, if the vane is stationary. **07**
- Q.3** (a) Write comparison between Impulse and Reaction hydraulic turbine. **07**  
(b) A Pelton wheel having a mean bucket diameter of 1.25 m is running at 1000 RPM. The net head on the Pelton wheel is 800m. If the side clearance angle is  $15^\circ$  and discharge through the nozzle is  $0.1 \text{ m}^3/\text{s}$ , Calculate: Power available at the nozzle and hydraulic efficiency of the turbine. **07**
- OR**
- Q.3** (a) Describe draft tube theory. Derive expression for efficiency of draft tube. **07**  
(b) Classify different losses in the pipe flow. Explain any two minor losses. **07**
- Q.4** (a) Describe (a) minimum starting speed of centrifugal pump and (b) cavitation in centrifugal pump. **07**  
(b) Define and derive specific speed relation for pump. **07**
- OR**
- Q.4** (a) Write down difference between Positive displacement pumps and Rotodynamic pumps. **07**  
(b) Why reciprocating pump can not run at high speed? **07**
- Q.5** (a) Explain root blower with the neat sketch and derive expression for the Roots efficiency. **07**  
(b) Why clearance volume is provided in Reciprocating compressor? **07**
- OR**
- Q.5** (a) Classify rotary compressors. **07**  
(b) Explain aerofoil blading with neat sketch and nomenclature related to aerofoil blade. **07**

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