Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER IV– • EXAMINATION – SUMMER - 2016

Subject Code: X41902 **Date:19/11/2016**

Subject Name: Fluid Power Engineering

Time:02:30 PM to 5:00 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)**	A jet of water of 30 mm diameter strikes on the higed rectangular plate weight 100 N at the centre of the plate. The velocity of the jet is 8 m/s find (1) angle through which the plate will swing and (2) force must be applied at the lower edge of the plate in order to keep the plate vertical.	**07**
	(b	A Kaplan turbine produces 25 MW operating under a head of 40m. the blade tip diameter is 2.5 times the hub diameter and the overall efficiency is 0.9. if the speed and flow ratio are 2 and 0.6 respectively calculate diameter and speed of turbine	**07**
Q.2	**(a)**	Give classification of hydraulic turbine.	**07**
	(b	A single stage reciprocating air compressor is required to compress 90 m^3 air per min. from 1 bar and 300 k to 10 bar. Calculate the temperature at the end of compressor, work done, power required, heat rejected and change in internal energy when process is isothermal. Assume no clearance.	**07**
		OR	
	(b	Derive the equation of work done by jet when moving plate is vertical and along the jet.	**07**
Q.3	**(a)**	Explain each and every component of hydro power plant with its lay out.	**07**
	(b	Derive darcy-weisbach formula for head loss due to friction in pipe flow.	**07**
		OR	
Q.3	**(a)**	Explain construction and working of Kaplan turbine with neat sketch.	**07**
	(b	Derive chezy`s formula for loss of head due to friction in pipes.	**07**
Q.4	**(a)**	Explain construction and working of axial flow compressor.	**07**
	(b	Discuss advantages of multi stage compressor and explain two stage reciprocating air compressor with intercooler.	**07**
		OR	
Q.4	**(a)**	Explain construction and working of vane type compressor.	**07**
	(b	Derive equation of volumetric efficiency for reciprocating air compressor	**07**
Q.5	**(a)**	Give classification of pump and explain working of centrifugal pump.	**07**
	(b	Explain main and operating characteristic curve of centrifugal pump.	**07**
		OR	
Q.5	**(a)**	Give comparison between reciprocating and centrifugal pump.	**07**
	(b	Derive eular`s equation for centrifugal pump.	**07**