

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171917

Date: 06/12/2018

Subject Name: Steam and Gas Turbines

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.

		MARKS
Q.1	(a) Explain different types of nozzle with neat sketch.	03
	(b) Explain classification of steam turbine.	04
	(c) Derive condition for maximum discharge through nozzle.	07
Q.2	(a) State the difference between impulse and reaction turbine.	03
	(b) Explain different losses in steam turbine.	04
	(c) What is compounding? Explain velocity compounding with neat sketch.	07
	OR	
	(c) In a single stage impulse turbine the blade angles are equal and the nozzle angle is $20^\circ$ . The velocity coefficient for the blade is 0.83. Find the maximum blade efficiency.	07
Q.3	(a) State the advantages and disadvantages of Gas turbine.	03
	(b) Draw the figure for Inter cooling and Regeneration of Gas turbine.	04
	(c) Explain Combined Cycle Power Plant with neat sketch?	07
	OR	
Q.3	(a) Classify the Gas turbine.	03
	(b) State the advantages and disadvantages of closed cycle gas turbine.	04
	(c) Explain Re heating with neat sketch.	07
Q.4	(a) State the difference between steam turbine and gas turbine.	03
	(b) State the different applications of Gas turbine.	04
	(c) What is governing of steam turbine? Explain any one type in detail.	07
	OR	
Q.4	(a) State the difference between closed cycle gas turbine and open cycle gas turbine.	03
	(b) Explain the principle of jet propulsion.	04
	(c) A simple impulse turbine has one ring of moving blades running at 150 m/s. the absolute velocity of the steam at exit from the stage is 85 m/s at an angle of $80^\circ$ from the tangential direction. Blade velocity coefficient is 0.82 and flow of steam through the stage is 2.5 kg/s. If the blades are equiangular, determine (1) Blade angles (2) Nozzle angle (3) Absolute steam velocity of steam issuing from nozzle (4) axial thrust.	07
Q.5	(a) Draw the neat sketch of Turbo-prop engine.	03
	(b) Find the optimum pressure ration for maximum specific work output.	04
	(c) Explain pulse jet engine with neat sketch.	07
	OR	
Q.5	(a) Draw the neat sketch of Rocket engine.	03
	(b) Find the efficiency of constant pressure closed cycle gas turbine.	04
	(c) Explain Ram jet engine with neat sketch.	07

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