MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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MLRS

III B.Tech I Sem Supply End Examination, December 2022
Thermal Engineering – II
(Mechanical)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
   Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	The power plant operates on which cycle.	2M	CO1	BL1
	b)	Define Draught.	2M	CO1	BL1
	c)	Write the few applications of nozzles.	2M	CO2	BL1
	d)	Define degree of under cooling.	2M	CO2	BL1
	e)	Define the term compounding.	2M	CO3	BL1
	f)	Distinguish between impulse and reaction turbine.	2M	CO3	BL2
	g)	What are the various sources of air leakage into a steam condenser?	2M	CO4	BL1
	h)	List the methods of improving the efficiency of a simple gas turbine.	2M	CO4	BL1
	i)	Write the principle of jet propulsion	2M	CO5	BL1
	j)	Define Thrust and Thrust power.	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	Show Rakine cycle on p-v ad T-s diagrams and explain process involved.	7M	CO1	BL2
	b)	What are the purpose of Regenerative ad Reheat cycle are used in power plants.	3M	CO1	BL1

OR

3	a)	Describe with a neat sketch, the construction & working of any one of the fire tube boiler.	6M	CO1	BL3
	b)	Name the all accessories and mountings parameters in a boiler.	4M	CO1	BL1

4	a)	Explain the function of nozzle used in steam turbines. Discuss the types of nozzles with neat sketches.	5M	CO2	BL2
	b)	Explain the Supersaturated or metastable flow of steam through a nozzle and significance of Wilson line.	5M	CO2	BL2

OR

5 a) Dry saturated steam at a pressure of 10 bar is expanded in a nozzle to a pressure of 0.7 bar. With the help of Mollier diagram find the velocity and dryness fraction of steam issuing from the nozzle, if the friction is neglected.
Also find the velocity and dryness fraction of steam, if 15% of the heat drop is lost in friction.   5M   CO2   BL3

   b) Explain what is meant by critical pressure ratio of a nozzle.   5M   CO2   BL2

6 a) Define the term 'degree of reaction' as applied to a reaction turbine. Show that for a Parson's reaction turbine, the degree of reaction is 50 percent.   5M   CO3   BL4

   b) Define a steam turbine and classify the steam turbines.   5M   CO3   BL1

OR

7 a) In a De-lavel turbine, the steam enters the wheel through a nozzle with a velocity of 500m/sec and at an angle of 20o to the direction of motion of the blade. The blade speed is 200m/s and the exit angle of moving blade is 25o. Find the inlet angle of the moving blade, exit velocity of steam and its direction and work done per kg of steam.   5M   CO3   BL4

   b) Derive the expression for diagram efficiency and obtain condition for maximum efficiency for impulse turbine.   5M   CO3   BL4

8 a) Describe with a neat sketch the working of a surface condenser.   5M   CO4   BL4

   b) What do you understand by the term vacuum efficiency of a condensing plant? On what factors does this efficiency depend?   5M   CO4   BL1

OR

9 a) Write a short note on semi-closed cycle gas turbine.   5M   CO4   BL1

   b) Write the merits and demerits of steam turbine.   5M   CO4   BL1

10 a) What is meant by thrust augmentation? When it is necessary? Describe any one method of thrust augmentation   5M   CO5   BL1

   b) Explain the turbo prop with a neat sketch.   5M   CO5   BL2

OR

11 a) Describe the working of Rocket engine with neat sketch.   5M   CO5   BL4

   b) List out the requirements of an ideal rocket propellant and give the applications of rockets   5M   CO5   BL1

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CO - Course Outcome   BL - Blooms Taxonomy Levels