Q.P. Code: 19ME0314 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations December-2021

THERMAL ENGINEERING

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the working principle of single stage single acting reciprocating compressor.	L2	6M
	b	Mention single stage compressor equation for work by neglecting clearance volume.	L2	6M

OR

2	a	Construct an expression for minimum work required for two stage reciprocating compressor with perfect inter-cooling by neglecting clearance volume.	L3	6M
	b	Explain the working of roots blower compressor with neat sketch.	L2	6M

UNIT-II

3		A gas turbine unit receives air at 100 kPa and 300 K and compresses it adiabatically to 620 kPa with efficiency of the compressor 88%. The fuel has a heating value of 44180KJ/Kg and the Fuel/air ratio is 0.017 kg fuel /kg air. The turbine internal efficiency is 90%. Calculate the Compressor work, turbine work and thermal efficiency. Take Cp= 1.005KJ/Kg K.	L3	12M

OR

4	a	Explain the types of gas turbine power plant.	L2	6M
	b	Explain the efficiency improvement methods of gas turbine.	L2	6M

UNIT-III

5		Define Steam nozzle and also explain about expansion of steam in nozzle with neat sketch.	L1	12M

OR

6	a	Explain what is meant by critical pressure ratio of a nozzle.	L2	6M
	b	The dry sat steam at a pressure of 5 bar is expanded is entropically in nozzle to a pressure of 0.2 bar. Find the velocity of steam during the nozzle.	L3	6M

UNIT-IV

7	a	Explain the working process of reaction turbine.	L2	6M
	b	Show the velocity triangle diagram of reaction turbine.	L3	6M

OR

8	a	Explain the working process of impulse turbine.	L2	6M
	b	What are the methods of steam turbine governing?	L1	6M

UNIT-V

9	a	Explain engine, heat engine and applications of IC engines.	L2	6M
	b	With a neat sketch explain any three parts in Internal Combustion engine.	L2	6M

OR

10	a	Explain any six classifications of Internal Combustion engines.	L2	6M
	b	Show the theoretical and actual valve-timing diagram for Diesel engine.	L2	6M

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