O.P.Code:23ME0314	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Regular Examinations December-2025

THERMAL ENGINEERING

(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Write two functions of the piston in an I.C. engine.	CO1	L2	2M
	b	What are the function of the valves in an I.C. engine?	CO2	L1	2M
	c	Compare the functions of ignition systems in CI Engine and SI Engines.	CO1	L2	2M
	d	Why heat engines need cooling system?	CO2	L1	2M
	e	State two functions of a fuel filter.	CO1	L1	2M
	f	State two differences between pre-ignition and knocking.	CO	L1	2M
	g	Define delay period in CI engine combustion.	CO3	L2	2M
	h	Mention two methods of reducing diesel knock.	CO1	L1	2M
	i	Define volumetric efficiency of a compressor.	CO2	L2	2M
	j	What is clearance volume in a reciprocating compressor?	CO1	L2	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Explain any six classifications of Internal Combustion engines.	CO1	L1	5M
	b	Compare 2-stroke engine with 4-stroke engine.	CO1	L2	5M
		OR			
3		Show the theoretical and actual Port-timing diagram for Diesel engine.	CO1	L1	10M

UNIT-II

4	a	Explain with neat sketch the forced circulation water cooling system.	CO12	L1	5M
	b	Compare air cooling and liquid cooling methods with respect to efficiency and applications.	CO1	L1	5M
		OR			
5		Compare the different types of lubrication systems: splash, pressurized, and mist lubrication.	CO1	L1	10M

UNIT-III

6		Explain gasoline fuel injection system and state its advantages over carburetor system.	CO1	L2	10M
		OR			
7	a	Write a note on the importance of flame speed in S.I. engine combustion.	CO1	L1	4M
	b	Describe the fuel supply system in a petrol (S.I.) engine with neat sketch.	CO1	L1	6M

UNIT-IV

8		The following results refer to a test on a petrol engine: Indicated power = 30 kW, Brake power = 26 kW, Engine speed = 1000 rpm, fuel per brake power hour = 0.35 kg, calorific value of the fuel used = 43900 kJ/kg. Calculate: i) The indicated thermal efficiency ii) The brake thermal.	CO3	L2	10M

		OR			
9	a	Explain diesel knock. List its causes and suggest methods to reduce or control it.	CO1	L2	5M
	b	Explain the stages of combustion in a CI engine with a neat sketch.	CO2	L3	5M

UNIT-V

10		A single stage reciprocating compressor takes 1 m3 of air per minute at 1.013 bar and 15 oC and delivers it at 7 bar. Assuming that the law of compression is pV1.35 = constant, and the clearance is negligible, calculate the indicated power.	CO3	L3	10M
		OR			
11		Construct the multi stage compressor equation for work with perfect inter cooling.	CO	L6	10M

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