Regulation R18 Subject code: 2P5CB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, February 2024

Thermal Engineering-I

(Mechanical Engineering)

Maximum Marks: 70 Date:17.02.2024 **Duration: 3 Hours**

Note: **This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

	All the following questions carry equal marks (10X2M=20 Marks)	CO	Bloom Tx
1	Stoichiometric air-fuel ratio means?	1	L1
2	List the advantages of valve timing diagram?	1	L1
3	What is called flame front and flame velocity?	2	L1
4	What is ignition delay period?	2	L1
5	Define Brake Power	3	L1
6	Define Friction Power	3	L1
7	Define Air Compressor	4	L1
8	Define Clearance ratio of a compressor	4	L1
9	Define Degree of reaction	5	L1
10	What is Work done Factor?	5	L1

Part-B

	Answer All the following questions. (5X10M=50Marks)		
11	Explain cooling system for IC engines. [10M]	1	L2
	OR		
12	State and explain different combustion stages in SI engine. [10M]	1	L2
13	What are the types of fuel injection systems? Explain anyone with a neat sketch. [10M]	2	L4
	OR		
14	Explain Battery ignition system with a neat diagram. [10M]	2	L2
15	A two stroke diesel engine was motored when meter reading was 1.5 kW. Then the test on the engine was carried with following results Brake torque = 120N-m; RPM =600; fuel used = 2.5kg; CV of fuel = 41kJ/kg; Cooling water used = 820kg; rise in cooling water temperature is 10^0C; Exhaust gas temp. =350^0C; Room temp.= 25^0C; A:F=32:1; Calculate: BP, I.P Mechanical Efficiency and indicated thermal efficiencies and draw heat balance sheet on Percentage Basis. [10M]	3	L3

	OR		
16	A) What is the significance of Morse test. Explain in detail. [5M] B) Explain Willan's line method. [5M]	3	L3 L2
17	A) Explain the working of Axial Flow compressor with neat Sketch. [5M] B) Explain Velocity diagram of axial flow compressor. [5M]	4	L2 L3
	OR		
18	Determine the efficiency of vane type compressor which has an air delivery of $0.05m^3$/rev when it compresses air from 1 bar to 1.5 bar where there is 40% pressure rise due to internal compression before back flow occurs. [10M]	4	L5
19	A) What is Air Refrigeration? Discuss Reversed Carnot Cycle in detail. [5M] B) Give important applications of refrigeration. [5M]	5	L3 L3
	OR		
20	Differentiate between Simple Vapour compression and vapour absorption systems. [10M]	5	L3