Regulation R18 Subject code: 2P5CB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, January 2023

THERMAL ENGINEERING-I

(Mechanical Engineering)

Maximum Marks: 70 09-01-2023 **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)

1 Stoichiometric air-fuel ratio means?
2 List the advantages of valve timing diagram?
3 What is called flame front and flame velocity?
4 What is ignition delay period?
5 Define Indicated Power
6 Define Friction Power
7 Define Air Compressor
8 Define a single stage compressor
9 Give an example of Dynamic type rotary compressor
10 Define a Rotary compressor

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Draw a neat sketch and explain the working of splash lubricating system. [10]

OR

12 Analyze the stages of combustion in SI engines elaborating the flame front propagation. [10]

13 What are anti knock agents? Indicate the substances used and their effects on reducing of knocking. [10]

OR

14 Explain Battery ignition system with a neat diagram? [10]

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. [10]

OR

16 A) What is the significance of Morse test. Explain in detail. [5]

B) Explain Willan's line method. [5]

17 a) Explain the working of Axial Flow compressor with neat Sketch. [5]
b) Explain Velocity diagram of axial flow compressor. [5]

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. [10]

19 Explain Air Conditioning Cycle with neat Sketch. [5]

OR

20 Explain the working of Central System in Air Conditioning with neat sketch. [5]