R20 Regulation *Subject code: 3P3CD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2024

THERMODYNAMICS
(ME)

Maximum Marks: 70 Date:25.07.2024 Duration: 3 hours

Note: 1.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 which carries 10M.
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	Define extensive property?	1	L1
2	Mention different thermodynamic systems?	1	L1
3	What is Perpetual Motion Machine of first kind – PMM1?	2	L1
4	Define partial pressure?	2	L1
5	What is compressibility factor?	3	L1
6	Define Triple Point?	3	L1
7	State the expression for Vander wall's equation and determine the constants?	4	L1
8	What is meant by the enthalpy of a mixture of ideal gases?	4	L1
9	Write the relation between specific heats and adiabatic index?	5	L1
10	What are the process of Ericsson cycle?	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Sketch the constant volume gas thermometer and explain. [10]	1	L2
	OR		
12	Describe briefly thermodynamic systems. [10]	1	L3
13	Explain with the help of a neat sketch the process of Free Expansion. [10]	2	L2
	OR		
14	In a gas turbine unit, the gases flow through the turbine is 15 kg /sec and the power developed by the turbine is 12000KW. The enthalpies of gases at the inlet and outlet are 1260 KJ/kg and 400 KJ/kg respectively, and the velocity of gases at the inlet and outlet are 50 m/s and 110 m/s respectively. [10]	2	L2
15	Explain the phase transformation process with diagram. [10]	3	L2
	OR		
16	Describe with neat sketch P-V-T surfaces. [10]	3	L3

17	Explain the Volumetric analysis of a gas mixture. [10]	4	L2
	OR		
18	The volume analysis of gas and other data are as follows: [10] Constituent Percentage Molecular Weight Oxygen 23.14 32 Nitrogen 75.53 28 Argon 1.28 40 Carbon dioxide 0.05 44 Calculate i) Gas constant for air and ii) Apparent molecular weight	4	L4
19	Derive an expression for the efficiency of sterling cycle. [10]	5	L3
	OR		
20	Derive an expression for the air standard efficiency of diesel cycle. [10]	5	L3