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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2023 (2015 scheme)

Course Code: MR307

Course Name: THERMODYNAMICS

Max. Marks: 100 Duration: 3 Hours

(Use of Psychrometric chart permitted)

PART A

Answer all questions. Each question carries 5 marks

1		Discuss about Thermodynamic equilibrium.	5
2		Illustrate free expansion with an example.	5
3		What is a Carnot cycle and explain its four processes.	5
4		Derive Clausius inequality.	5
5		Write a short note on inversion curve.	5
6		State Third law of thermodynamics.	5
7		What is meant by specific humidity and relative humidity	5
8		Distinguish between DBT and WBT.	5

PART B

Answer any three questions. Each question carries 10 marks

9	a)	Give a comparison between microscopic and macroscopic approach.	6
	b)	Define the term Continuum concept.	4
10	a)	Write a short note on Zeroth law of thermodynamics and its application.	4
	b)	Define path function and point function with an example	6
11	a)	State second law of thermodynamics with an example.	6
	b)	Elucidate in detail about PMM2.	4
12	a)	Illustrate the working of a refrigerator with neat figure	5
	b)	Explain the working of a heat pump with neat figure	5
13	a)	What is meant by dead state and availability	5
	b)	List out the different types of irreversibility	5

PART C

Answer any two questions. Each question carries 15 marks

14	a)	Derive an expression for Maxwell's equations	5
	b)	Derive an expression for first and second Tds equations	10

15	a)	Explain Joule Kelvin effect plot T-P curve showing cooling and heating zones	10
	b)	Discuss about Throttling process	5
16		200 m^3 of air per minute at 15°C DBT and 75% RH is heated until its temperature is 25 °C. Find i)RH of heated air ii)WBT of heated air iii)Heat added to air per minute	15
17	a)	Write a short note on dew point temperature	5
	b)	An air-water vapour mixture enters an adiabatic saturator at 30°C and leaves at 20°C, which is the adiabatic saturation temperature. The pressure remains constant at 100 kPa. Determine the relative humidity and the humidity ratio of the inlet mixture	10

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