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Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: MR307

Course Name: THERMODYNAMICS

Max. Marks: 100 *Use of psychometric chart permitted* Duration: 3 Hours

PART A

Answer all questions. Each question carries 5 marks

1		What is thermodynamic equilibrium?	(5)
2		What is PMM1? Why it is not possible?	(5)
3		Define thermal reservoir?	(5)
4		Explain law of degradation of energy?	(5)
5		What is inversion temperature?	(5)
6		Define third law of thermodynamics.	(5)
7		Define dew point temperature?	(5)
8		Explain a) SHF b) BHF ?	(5)

PART B

Answer any three questions. Each question carries 10 marks

9	a)	Differentiate between macroscopic and microscopic approach?	(5)
	b)	Define the concept of continuum in thermodynamics?	(5)
10	a)	Explain free expansion of work?	(5)
	b)	What is PdV work? Explain the various forms of work?	(5)
11	a)	Explain Carnot theorem and its corollaries?	(7)
	b)	Write any two causes of irreversibility?	(3)
12		Explain the principle of increase of entropy with any one application?	(10)
13		Explain different types of energy?	(10)

PART C

Answer any two questions. Each question carries 15 marks

14	a)	Explain joule Kelvin effect plot T-P curve showing cooling and heating zones?	(10
	b)	What is isenthalpic curve?	(5)
15	a)	Derive first and second TdS equations.	(10)
	b)	Write Maxwell's Equation?	(5)

16 a) $50m^3$ of air at 35^0C DBT and 50% R.H is cooled to 25^0C DBT maintaining its specific humidity constant Determine (i) Relative humidity of cooled air (ii) Heat removed from air (10)

b) Define sensible cooling (5)

17 a) The following data pertain to an air conditioning system:
Unconditioned space DBT = 35^0C
Unconditioned space WBT = 22^0C
Cold air duct surface temperature = 14^0C
Determine (i) Dew point temperature
(ii) whether or not condensation will form on the duct (7)

b) $250m^3$ of air per minute at 15^0C DBT and 75% RH is heated until its temperature is 25^0C Find (i) R.H of heated air
(ii) Wet bulb temperature of heated air
(iii) Heat added to air per minute (8)

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