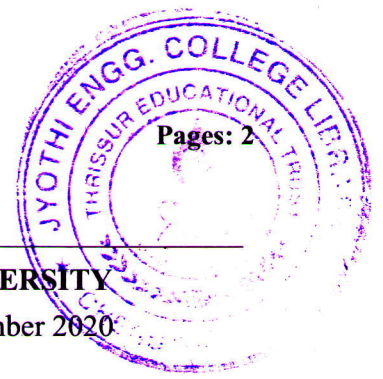


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Reg No.: _____

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°C DBT and 50% R.H is cooled to 25°C DBT maintaining its specific humidity constant Determine (i) Relative humidity of cooled air (10)
(ii) Heat removed from air
- b) Define sensible cooling (5)
- 17 a) The following data pertain to an air conditioning system:
Unconditioned space DBT = 35°C (7)
Unconditioned space WBT = 22°C
Cold air duct surface temperature = 14°C
Determine (i) Dew point temperature
(ii) whether or not condensation will form on the duct
- b) 250m^3 of air per minute at 15°C DBT and 75% RH is heated until its temperature is 25°C Find (i) R.H of heated air (8)
(ii) Wet bulb temperature of heated air
(iii) Heat added to air per minute
