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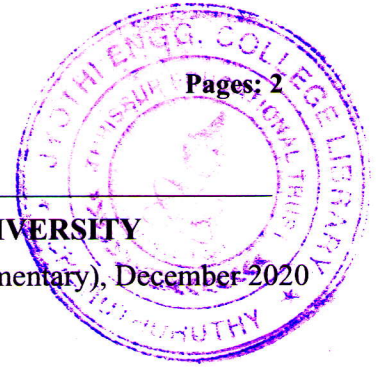
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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth Semester B.Tech Degree Examination (Regular and Supplementary), December-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 Define Temperature and different temperature scales. (5)
- 2 Explain first law of thermodynamics. (5)
- 3 What are the different types of irreversibility? (5)
- 4 Write the Gibbs equations. (5)
- 5 State and explain third law of thermodynamics. (5)
- 6 Write clausius clapeyron equation and define the relevant terms in it. (5)
- 7 Define DBT and WBT. (5)
- 8 Define specific humidity and relative humidity. (5)

**PART B**

*Answer any three questions. Each question carries 10 marks*

- 9 a) Explain thermodynamic equilibrium. (5)  
b) What do you mean by quasi static process? (5)
- 10 a) Explain joules experiment with neat sketch. (5)  
b) What is indicator diagram? (5)
- 11 Explain all the four processes involved in a Carnot cycle and deduce an expression for efficiency. (10)
- 12 State and prove Clausius theorem. (10)
- 13 a) Define the two statements of the second law of thermodynamics. (5)  
b) What is useful work? (5)

**PART C**

*Answer any two questions. Each question carries 15 marks*

- 14 a) Derive Maxwell's equations. (10)  
b) Derive Tds equation. (5)
- 15 a) Derive Clausius - Clapeyron equation. (10)  
b) Explain throttling process. (5)

- 16 The atmospheric conditions are;  $20^{\circ}\text{C}$  and specific humidity of  $0.0095\text{kg/kg}$  of dry air. Calculate the following (i) Partial pressure of vapour (ii) Relative humidity (15)  
(iii) Dew point temperature
- 17 Explain the following psychometric process with diagram (i) sensible heating  
(ii) cooling and dehumidification (iii) heating and humidification (15)

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