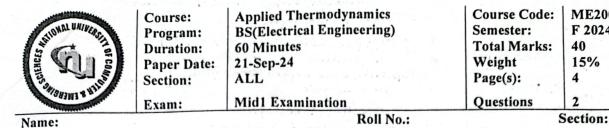
ME2002

F 2024

40

15%

National University of Computer and Emerging Sciences, Lahore Campus



Instruction/Notes:

> Use valid assumptions if needed, don't ask any questions.

Your answers should be correct up to three decimal places with appropriate units.

Values read from tables should have the same number of significant figures as mentioned in the tables.

This is an open book, and open notes exam

CLO 1: Analyze a thermodynamics process

- A closed system contains 5 kg of water in a Boiler. Initially, the water has a temperature of [20] 25°C and a specific volume of 1. 25616 m^3/kg . The system operates in two stages:
 - Stage 1: The system is heated until the pressure inside the boiler reaches 200 kPa . keeping volume constant.
 - Stage 2: The system is then cooled from a temperature of 150°C, allowing the pressure and temperature to change, but keeping volume constant.

2-02 0.0289 Describe the phase and conditions of the water at $v = 1.25616 \, m3/kg$ and $T = 25^{\circ}C$?

- b) When the pressure inside the boiler reaches 200 kPa, what will be the state of the water? Determine the corresponding temperature. TN 120.1
- After the system cools from 150°C, what will be the total volume V of the water in the system? Describe the state of the water at this point.

If the water is a saturated mixture of vapor and liquid, what is its quality at $T = 100^{\circ}C$? Also, illustrate this state and quality on a T-v diagram. X=0.7507

CLO 1:Analyze a thermodynamics process

Q2 Urea plants use ammonia as a working substance. In such a set up Ammonia is at 10°C with mass of 300 grams in a piston cylinder with an initial volume of 0.03 m^3 . The piston-has a design such that a pressure of 900 kPa will float it. Now the ammonia is slowly heated to 50°C. Identify the states involved, find the final pressure and volume and draw this entire process on a Pv diagram.

900 kB, 21.486 PF = 1393.90%