Thermodynamics (MEL2020)
Indian Institute of Technology Jodhpur

Tutorial-4 Date: 09th February 2022

Instructions:

- *Answer all the questions*
- *Please write your solutions/explanations on an A4 size paper with your own handwriting*
- *Scan all pages as a single pdf file and upload in google classroom before 8 PM same day*
- *This will give you **1 point** towards your total evaluation*
- *Late submission lead to deduction of **half mark.***

1. A rigid tank whose volume is unknown is divided into two parts by a partition. One side of the tank contains an ideal gas at 927°C. The other side is evacuated and has a volume twice the size of the part containing the gas. The partition is now removed and the gas expands to fill the entire tank. Heat is now applied to the gas until the pressure equals the initial pressure. Determine the final temperature of the gas.

2. Determine the specific volume of superheated water vapor at 15 MPa and 350°C, using **(a)** the ideal-gas equation, **(b)** the generalized compressibility chart, and **(c)** the steam tables. Also determine the error involved in the first two cases.

3. Determine the specific volume of refrigerant-134a vapor at 0.9 MPa and 70°C based on ***(a)*** the ideal-gas equation, (***b***) the generalized compressibility chart, and (***c***) data from tables. Also, determine the error involved in the first two cases.