Time: 60 Min   Max.marks: 5

Academic year: 2018-19

1.   Explain in detail about concept of continuum with neat sketch?

   b) A quantity of air has a volume of $2.5m^3$ and a pressure of 12bar at temperature 135^0C. It is expanded in a cylinder at a constant temperature to a pressure of 3.8bar. Determine the amount of work done by the air during expansion?

2.   Differentiate between path and point functions? Are work and heat path functions? Justify.

   b) Derive the work done equations for polytropic non-flow process in a closed system?

3.   define universe, control volume, thermodynamic system and boundary, steady flow and un steady flow process?

4.   a) Differentiate macroscopic view and microscopic view.

   b) Explain the constant volume gas thermometer with neat sketch.

5. (a)Derive steady flow energy equation for throttling device and steam condenser?

   b) A gas expands through an ideally insulated nozzle following a reversible polytropic law $pv^{1.2}=c$. There is no change in potential energy but the pressure drops from 15bar to 6.2bar and the specific volume increases from $1.5m^3$ to $4.3m^3$. if the velocity is 80 m/sec. determine the exit velocity.

6. a) Explain joules experiment for a closed system undergoing a cyclic process with neat sketch?

   b) A stationary mass of gas is compressed without friction from an initial state of $5m^3$ and 10Mpa to a final state of $2m^3$, remaining pressure as constant during the process. There is a transfer of 170KJ of heat from the gas during the process. Calculate the internal energy during the change of process?