Subject:- Engineering Thermodynamics **Max Marks:- 30**

Duration:- 90mins **Minor:- 2**

Branch:-B.E. MECHANICAL, 4th Semester

Instructions:- Steam tables, property tables and charts are allowed

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1)

a) Sketch a gas turbine system indicating all the three refinements together.

b) Define Equilibrium constant parameters for chemical equilibrium of an ideal gas mixture.

c) How is phase equilibrium achieved in a single component system?

d) Differentiate Stirling and Ericsson cycles with PV-TS diagrams

e) Draw a generalized jet propulsion system with all critical components.

(2x5=10)

2) A mixture of 3kmol of CO, 2.5kmol of O_2 and 8kmol of N_2 is heated to 2600K at a pressure of 5 atm. Determine equilibrium composition of the mixture. **(7)**

3) Specific power output of a turbine is 336.5kW and exhaust gases leave the turbine at 700K. Calculate turbine pressure ratio. **(6)**

4) A Diesel cycle operates at 1 bar at the beginning of compression and volume is compressed to 1/16 of the initial volume. Heat is supplied until the volume is twice that of the clearance volume. Calculate mean effective pressure of the cycle. **(7)**