

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
MGM's, Jawaharalal Nehru Engineering College, Aurangabad
Mid Semester Examination – Sept.-Oct. 2019
Course: S.Y. B. Tech in Mechanical Engineering Sem: III
Subject Name: THERMODYNAMICS
Subject Code: BT-MEC 305
Max Marks: 20
Date: - Oct. 9, 2019
Duration: - 1 Hr.

Instructions to the Students:

1. Use of scientific calculator is permitted
2. Draw schematic diagrams whenever necessary
3. Assume suitable data if necessary
4. Mark one correct answer for MCQs

Q.1	Choose the correct answer.	(Level/CO)	Marks
1	Density of fluid is	CO1	1
2	a) Extensive property b) Intensive Property c) Path Function d) None of these	CO1	1
3	Thermodynamic equilibrium is	CO1	1
4	a) Thermal Equilibrium b) Chemical Equilibrium c) Mechanical Equilibrium d) All of these	CO1	1
5	Isochoric Process involves	CO3	1
6	a) Constant Pressure b) Constant Volume c) Constant Temperature d) Constant Entropy	CO2	1
7	Kelvin-Planck statement states no heat engine exists	CO2	1
8	a) Without Heat Gain b) Without Heat Rejection c) Without Work d) None of these	CO2	1
9	Absolute thermodynamic temperature is expressed as	CO2	1
10	a) temperature in °C b) temperature in °F c) temperature in K d) None of these	CO1	1
11	Work and Heat transfers are	CO1	1
12	a) State Function b) Path Function c) Properties of System d) None of these	CO1	1
13	Solve Any Two of the following:		5
14	(A) Define Zeroth Law of Thermodynamics and explain with scientific example	CO2	3
15	(B) A gas starts with 200 J of the internal energy and 180 J of heat is added to the gas which produce 70 J work. Determine the final Internal energy of the gas?	CO2	3
16	(C) Explain Clausius statement with scientific example of refrigerator	CO2	3
17	Solve Any One of the following:		8
18	(A) A turbine operates under steady flow conditions, receiving steam 1.2 MPa at 188 °C with enthalpy 2785 kJ/kg and velocity 33.3 m/s at elevation of 3 m. This steam leaves the turbine at 20 kPa with enthalpy 2512 kJ/kg and velocity 100 m/s with elevation 0 m. Heat is lost to the surrounding at the rate of 0.29 kJ/s. If the steam flow rate through the turbine is 0.42 kg/s, what is the power output of the turbine in kW?	CO3	8
19	(B) In an insulated Nozzle, enthalpy of fluid passing is 3000 kJ/kg and velocity is 60 m/s while at the exit the enthalpy reduced to 2762 kJ/kg. The nozzle is kept horizontal. If the inlet area is 0.1 m ² and specific volume at inlet is 0.187 m ³ /kg, determine the velocity at exit of nozzle and mass flow rate through the nozzle.	CO3	8
20	*** End ***		