AJEENKYA
D Y PATIL UNIVERSITY

End Term Examination (December 2019)

School: School of Engineering   **Program:** BTech. Mechanical Engineering

Course: Engineering Thermodynamics   **Course Code**: MEC 202

Semester: III   **Max Marks:** 40   **Duration (mins) :** 90

	All questions are compulsory	Marks
Q 1	Apply First Law of thermodynamics to Nozzle, Diffuser, Compressor, Turbine, Throttling device and Heat Exchanger	[5]
Q 2	State and explain basic laws in conduction, convection and radiation, combined modes of heat transfer with examples.	[5]
Q 3	State and explain Kelvin- Planck and Clausius statements of Second Law, Reversible and irreversible engines and their efficiency.	[5]
Q 4	Sketch and explain Otto cycle on PV and TS diagram	[5]
Q 5	Sketch and explain Rankine cycle on PV and TS diagram	[5]
Q 6	The blower handles 1 kg/sec of air at 20°C. It compresses air adiabatically and consumes 15 kW. The inlet and outlet velocities are 100m/sec and 200m/sec. Determine exit air temperature. C_p of air = 1.005kJ/kg K	[5]
Q 7	Define dryness fraction of steam. Mention steam types and state steam applications	[5]
Q 8	A steam power plan operates ideally in the basic Rankine cycle. It receives 4 MPa steam from boiler firing coal to liberate heat at a steady rate of 100 MW. The steam after expansion in the turbine is exhausted to condenser that operates at 7.5 KPa. Calculate the following. 1. Cycle efficiency. 2. Work ratio for the cycle. 3. Power output for the plant. 4. Mass flow rate of working fluid. 5. Specific steam consumption	[5]