Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

I SEMESTER B.TECH. END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: BASIC MECHANICAL ENGINEERINGNG [MME 1001]

REVISED CREDIT SYSTEM
(26/11/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.
- Use of Steam Tables is permitted

1A. Steam generated in a boiler at pressure of 0.04 MPa and at a temperature of 88°C is parallelly led through two chambers A & B in equal proportions for process heating. The heat loss due to process heating is 2200.46kJ/kg in chamber A and 68.87% in chamber B. Further due to ageing insulation of the conduit, steam looses 11.4% heat before entering chamber 'A'. Determine the condition and related parameter of the steam at the exit point of chambers A & B. Assume specific heat of superheated steam and water as 2.25 kJ/kg°K and 4.187 kJ/kg°K respectively. **05**

1B. With neat sketches illustrate the propelling force in an impulse turbine and the working of a Pelton Wheel. **05**

2A. (i) Draw the general layout of a thermal power plant and name the various components **03+02**

(ii)Explain the functions of evaporator and condenser in an vapour compression refrigeration system.

2B. A 80 mm wide belt transmitting power between two pulleys rotating in opposite directions with a speed reduction ratio of 5 has permissible tension per meter of the width as 8kN. The speed and diameter of the larger pulley are 150RPM and 400 mm respectively. Determine the power transmitted by the drive and the length of the belt if the centre distance is 2 meters and the coefficient of friction is 0.3. **05**

3A. Draw the neat sketch of an engine lathe, label the parts and explain its working principle. **05**

3B. With line diagrams explain the various gear systems used in mechanical power transmission. **05**

4A. The following data refers to a twin cylinder IC engine generating power in every revolution of the crank shaft. **05**

Total stroke volume: 2litres, No of cycles per revolution: 1400, Mean effective pressure: 0.64 MPa, Fuel consumption: 0.15litres per min., Density of fuel: 800kg/m^3, Calorific value of the fuel: 45000kJ/kg. Determine indicated thermal efficiency?

4B. With neat sketches and a P-V diagram explain the working of a four stroke I.C. engine in which heat addition and heat rejection takes place at constant volume. **05**

5A. Explain in detail the six pattern making allowances and give the ingredients of the moulding sand. **05**

5B. With a neat sketch explain the electric resistance welding process and differentiate between straight polarity and reverse polarity used in electric arc welding process. **05**