Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

I SEMESTER B.TECH END SEMESTER MAKEUP EXAMINATIONS,

DECEMBER, 2017

SUBJECT: BASIC MECHANICAL ENGINEERING [MME 1001]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. 5kg of water is heated from 40℃ to superheated steam at 150℃ at a constant pressure of 3 bar. Determine the total amount of heat added in the heating process and the amount of superheat. Assume the specific heat of water as 4.187 kJ/Kg°K and that of super-heated steam as 2.25 kJ/Kg°K. **05**

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

2A. (i)Draw the general layout of a Thermal Power Plant and name the various components? **03+02**

(ii)Explain the functions of a Evaporator and a Condenser in a vapour compression refrigeration system

2B. The shaft from a motor is connected to gear A which rotates at 2100RPM. Gears B and C are compound gears as well as gears D and E. Gear A meshes with gear B and gear C drives gear D. Gear E meshes with gear F which is fitted on the driven shaft. The number of teeth on gears A, B, C, D, E and F are 20, 30, 40, 50, 60 & 70 respectively. Sketch the arrangement and determine the speed of gear F? Calculate the centre distance between the driver and driven shafts if the module of gears is 2mm. **05**

3A. Draw the neat sketch of an engine lathe, label the parts and explain the functions of the parts of carriage assembly. **05**

3B. Differentiate between open and crossed belt drives and with a neat sketch explain the working of a fast and loose pulley. **05**

4A. A four cylinder two stroke petrol engine with stroke to bore ratio of 1.2 develops 32 kW at 2500 rpm. The mean effective pressure on the piston is 8 bar and mechanical efficiency is 85 %. Determine (i) the diameter and stroke of each cylinder and (ii) the brake thermal **05**

efficiency, if the fuel consumption is 9 kg/hr and the fuel is having calorific value of 44000 kJ/kg

4B. With neat sketches and illustrating the pressure volume changes explain the working of a 4 stroke diesel engine. **05**

5A. Explain any five each pattern making allowances and desirable properties of moulding sand. **05**

5B. With a neat sketch explain the oxy acetylene gas welding process and discuss the different type of flames. **05**