Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

II SEMESTER B.TECH END SEMESTER EXAMINATIONS, JULY 2016

SUBJECT: BASIC MECHANICAL ENGINEERING [MME 1001]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. An open belt running over two pulleys 1.5m and 1.0m diameter connects two parallel shafts 4.80m apart. The initial tension in the belt when stationary is 3000N, if the smaller pulley is rotating at 600 rpm and coefficient of friction between the belt and pulley is 0.3. Determine the power transmitted neglecting centrifugal tension into account. **05**

1B. Differentiate between open and crossed belt drive system and Derive an expression for velocity ratio of compound gear train **05**

2A. Write in brief the basic differences between fire tube and water tube boiler and list the classification of boilers. **05**

2B. With a neat sketch explain working principle of an engine lathe and describe its major specifications with a line diagram. **05**

3A. Explain with neat sketches working of a 4-stroke C.I. engine. **05**

3B. A six cylinder, four stroke IC engine develops 100 kW of brake power at 800 rpm. The stroke to bore ratio is 1.5. The indicated mean effective pressure is 8 bar and mechanical efficiency is 80 %. Determine the cylinder diameter and piston stroke of the engine. **05**

4A. 400 Kg of steam at a pressure of 12 bar and 0.87 dry is generated by a boiler and it enters the super heater, where its temperature is raised such that the degree of superheat is 205^0C. If the temperature of feed water is 24^0C, determine **04**

I. Total heat added to feed water in the boiler.
II. Total heat absorbed in the super heater.

4B.	Sketch and explain working of radial drilling machine.	**03**
4C.	Describe briefly the working of simple impulse turbine with a neat sketch.	**03**
5A.	Explain with relevant sketches the resistance welding process and list its advantages.	**04**
5B.	With general block diagram explain the state and condition of refrigerant in a refrigeration system.	**03**
5C.	With a labeled block diagram explain solar thermal power plant.	**03**