



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



I SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV/DEC 2015

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. With neat sketches and a P-V diagram explain the working of a I.C. engine in 05 which power is generated in alternate revolutions of the crank shaft and heat addition takes place at constant pressure.
- 1B. In a food processing unit steam generated at a pressure of 0.038MPa and at 05 a temperature of 186°C is led through two chambers in succession for process heating. The loss in enthalpy in both the chambers is 70.5%. Determine the condition of steam and the related parameter at the exit point of the two chambers.
- **2A.** With neat sketches illustrating the propelling force and pressure velocity **05** changes explain the working of an impulse turbine.
- 2B. A compound gear train consists of 6 gear wheels A, B, C, D, E & F. A is the driver gear and F is the driven gear having 20 and 68 teeth's respectively. Gear A meshes with gear B and gears B & C are mounted on the same shaft. Gear C has 16 teeth and meshes with gear D. Gears D & E are mounted on the same shaft and gear E meshes with gear F. The speed reduction ratio from A to F is 8 and the speed reduction from A to B is equal to the speed reduction from C to D and E to F. Determine the number of teeth for gears B, D and E.
- **3A.** With neat sketches illustrate the specification of a lathe and explain its **05** working principle.

- 3B. The following data refers to a twin cylinder I.C. engine generating power in of every revolution of the crank shaft. Total stroke volume : 2 liters No. of cycles/second: 20 Mean effective pressure: 0.58 MPa. Fuel consumption : 10 liters / hour Specific gravity of the fuel: 0.8 Calorific value of the fuel: 45,000kJ/Kg. Determine indicated thermal efficiency.
- **4A.** Give the classification of boilers and highlight the advantages of water tube boilers over fire tube boilers.
- 4B. Differentiate betweeni) Pressure & fusion weldingii) Brazing & soldering.
- **4C.** Draw the schematic diagram of a nuclear power plant and name the various **03** parts.
- **5A.** Explain the functions of the different components of vapour compression **04** refrigeration system.
- **5B.** Explain any three each pattern making allowances and desirable properties **03** of moulding sand.
- **5C.** With a neat sketch explain the stepped cone pulley and write a short note on **03** creep in belt drives.

03