B. E. (First Semester) (CGPA) EXAMINATION, 2011-12

(Civil Engg. Branch)

BASIC MECHANICAL ENGINEERING

(CE–104)

Time : Three Hours

Maximum Marks : 60

Note : Attempt all questions. Question Nos. 2 to 6 have internal choices. Assume any misprint suitable data wherever necessary. Use of steam table is permitted.

1. Short answer type questions : 2 each

   (a) How draught is produced in locomotive boiler ?

   (b) Why brake power is always less than indicated power in I. C. engines ?

   (c) Define steady state heat transfer.

   (d) Mostly beds of machines are made of cast-iron. Why ?

   (e) What is the function of riser ?

2. (a) Describe the working of Lancarshire boiler with a neat diagram. 5

(b) Determine the amount of heat, which should be supplied to 2 kg of water at 25°C to convert it into steam at 5 bar and 0·9 dry. 5

Or

(a) Write down the name of various boiler accessories and describe their function. 5

(b) Define dryness fraction. Explain separating and throttling calorimeter method to determine dryness fraction of steam. 5

3. (a) Draw neat diagram of 2 stroke petrol engine and explain its working. 5

(b) 0·3 kg of nitrogen gas at 100 kPa and 40°C is contained in a cylinder. The piston is moved compressing nitrogen untill the pressure becomes 1 MPa and temperature becomes 160°C. The work done during the process is 30 kJ. Calculate the heat transferred from the nitrogen to the surroundings. C_V for nitrogen = 0·75 kJ/kg K. 5

Or

(a) Differentiate between petrol and diesel engines. 5

(b) Write down the statements of second law of thermodynamics and explain them. 5

4. (a) What are the various modes of heat transfer ? Explain each in brief. 5

(b) Describe summer air conditioning. 5

Or

Write Fourier equation of conduction and derive an expression for heat transfer by conduction through a composite wall. 10

5. (a) Write down composition, properties and applications of H. S. S. 5

(b) How is a lathe machine specified ? Write down the broad classification of lathe machines. 5

Or

Write short notes on the following : 10

(i) Comparator

(ii) Sine bar

6. (a) Explain various pattern allowances. 5

(b) Explain MIG welding with a diagram. 5

Or

Write short notes on any *two* of the following : 10

(i) Brazing

(ii) Gas welding

(iii) Casting defects