

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

**(Civil Engg. Branch)**

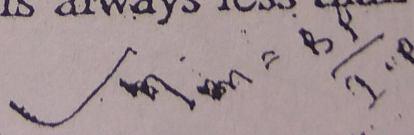

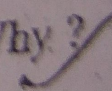
**BASIC MECHANICAL ENGINEERING**

**(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 Lancashire boiler with a neat diagram. 5

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- (b) Determine the amount of heat, which should be supplied to 2 kg of water at  $25^{\circ}\text{C}$  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  $40^{\circ}\text{C}$  is contained in a cylinder. The piston is moved compressing nitrogen until the pressure becomes 1 MPa and temperature becomes  $160^{\circ}\text{C}$ . The work done during the process is 30 kJ. Calculate the heat transferred from the nitrogen to the surroundings.  $C_V$  for nitrogen =  $0.75 \text{ kJ/kg K}$ . 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



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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