



[4261] – 111

Seat  
No.

**F.E. (Semester – II) Examination, 2012  
BASIC MECHANICAL ENGINEERING  
(2008 Pattern)**

Time : 3 Hours

Max. Marks : 100

- Instructions:**
- 1) Answers to the **two** Sections should be written in separate books.
  - 2) **Use** of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.
  - 3) **Assume** suitable data, if necessary.
  - 4) Attempt Q. 1 or 2, Q. 3 or 4, Q. 5 or 6, Q. 7 or 8, Q. 9 or Q. 10, Q. 11 or 12.

SECTION – I

1. A) Define open system, closed system, internal energy, enthalpy. (2×4)  
B) Explain irreversibility, reasons and examples. (3+3+2)  
OR
2. A) Define isolated system, isobaric process, isothermal process, cycle. (2×4)  
B) Explain heat engine and heat pump with formulas of efficiency and COP. (4+4)
3. A) Classify boilers, and state any four mountings and 4 accessories. (4+2+2)  
B) Explain two stroke petrol engine with figure. (4+4)

OR

4. A) Draw sketches and state uses of (4+4)  
i) impulse turbine ii) single acting reciprocating pump.  
B) Define Ton of refrigeration, pressure ratio of compressor, split AC, refrigeration effect. (2×4)
5. A) State and explain Newton's law of cooling. A person is standing in a room which is at 20°C. Find rate of heat transfer from person, if exposed surface area and body temp. are 1.6 m<sup>2</sup> and 36.7°C respectively.  
Given : convective heat transfer coefficient : 6W/m<sup>2</sup>k. (4+4)  
B) Describe hydro-electric power plant with figure. (4+4)  
C) Define thermal conductivity. 2

OR

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- 6. A) Explain concept of thermal resistance in series and parallel. (4+4)
- B) Describe Nuclear power plant with figure. (4+4)
- C) State Stefan Boltzman's law. 2

SECTION – II

- 7. A) Explain open belt and cross belt drive. (4+4)
- B) Explain with sketch : cone clutch and band brake. (4+4)

OR

- 8. A) Classify gears. State advantages of geardrive over belt drive. (4+4)
- B) Explain with sketch, types of keys and bevel gear. (4+4)
- 9. A) Explain soldering and brazing processes. (4+4)
- B) Describe shearing, bending, squeezing and drawing operations for sheet metal. (2x4)

OR

- 10. A) Explain steps of design process. 8
- B) Describe sand casting process. 8
- 11. A) Draw only block diagram of : center lathe machine. Explain any two operations. (4+4)
- B) Describe 4 operations on milling machine. (2x4)
- C) Sketch cylindrical grinding operation. 2

OR

- 12. A) Draw block diagram of CNC machine, state advantages and applications. (4+4)
- B) Describe 4 operations on drilling machines. (2x4)
- C) Sketch centerless grinding. 2

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