[4656] – 24

Seat No.	

F.E. (Semester – II) Examination, 2014
BASIC MECHANICAL ENGINEERING
(Old) (2008 Course)

Time : 3 Hours Max. Marks : 100

Note : *1) Solve Q. **1** or Q. **2**, Q. **3** or Q. **4** and Q. **5** or Q. **6** from Section **I**.*
*2) Solve Q. **7** or Q. **8**, Q. **9** or Q. **10** and Q. **11** or Q. **12** from Section **II**.*
*3) Assume suitable data **if required**.*

SECTION – I

1. A) Define 2nd law of thermodynamics. Explain any two applications of 2nd law of thermodynamics in brief. **(2+3+3)**

   B) Define ideal gas. List the laws followed by ideal gas and write ideal gas equation with units of each parameter. **(2+3+3)**

   OR

2. A) Sketch Carnot cycle on P-V and T-s Diagram, Indicate and explain the processes occurring. **(4+4)**

   B) What is heat engine ? Explain its efficiency. **(4+4)**

   A heat engine receives heat at the rate of 1500 kJ/min and gives an output of 8.2 kW. Determine : (i) The thermal efficiency; (ii) The rate of heat rejection.

3. A) Draw a neat sketch of any boiler, explain its working and list the components. **(4+4)**

   B) Explain the working of window room air conditioner with VCC cycle. **(4+4)**

   OR

4. A) Differentiate between four stroke Petrol and Diesel engines (4 points). **(2×4)**

   B) Draw only sketch of **(4+4)**
   i) Working principle of impulse and reaction turbine
   ii) Reciprocating compressor.

5. A) Explain Nuclear Power plant with neat sketch. **(4+4)**

   B) Draw sketch and derive the expression for heat transfer in a two layer hollow composite cylinder. **(2+6)**

   C) Write four examples of insulating materials. **2**

   OR

P.T.O.

6. A) Explain the working of Hydroelectric power plant with neat sketch. **(4+4)**

   B) The inner surface of a plane brick wall is at 60° C and the outer surface is at 35°C. If the rate of heat transfer is 58 W/m^2 for the wall, which is 220 mm thick. Calculate thermal conductivity of the brick in W/m°C. If the temperature of the inner surface is increased to 100°C what will be the rate of heat transfer ? **(4+4)**

   C) State Stefan Boltzman's Law. **2**

SECTION – II

7. A) Explain any two types of bearing with the neat sketches. **(4+4)**

   B) Explain the open belt drive and crossed belt drive with neat sketch. **(4+4)**

OR

8. A) Draw sketch and state uses of : flexible coupling and Oldham's coupling. **(4+4)**

   B) List different types of breaks and explain any one of with neat sketch. Also write its applications. **(2+4+2)**

9. A) Write a short note on ergonomic considerations in design. **8**

   B) State applications and properties of : Brass, Steel. **(4+4)**

OR

10. A) Describe casting process. **8**

    B) Explain with neat sketch spot welding and write its applications. **(6+2)**

11. A) Explain any four operations performed on drilling machine with neat sketch. **(4×2)**

    B) Explain the advantages and disadvantages of NC and CNC machine. **(4+4)**

    C) Draw sketch of saw milling. **2**

OR

12. A) Draw the neat label diagram of Centre lathe machine and explain the parts of it. **(4+4)**

    B) Explain: Face milling and End milling operation with sketch. **(4+4)**

    C) State the name of mechanism used for feeding drill head, in drilling machine. **2**

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