Total No. of Questions : 12] **[Total No. of Printed Pages : 3**

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F. E. Examination - 2010

BASIC MECHANICAL ENGINEERING

(2003 Course)

Time : 3 Hours] **[Max. Marks : 100**

Instructions :

(1) Answer Q. 1 or 2, Q. 3 or 4, Q. 5 or 6 and Q. 7 or 8, Q. 9 or 10, Q. 11 or 12.

*(2) Answers to the **two sections** should be written in **separate books**.*

(3) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(4) Assume suitable data, if necessary.

SECTION - I

Q.1) (A) Define : Process, Path, State, Cycle, System. **[05]**

(B) Explain Bourdon Pressure Gauge with sketch. **[06]**

(C) The casting of mass 12 kg has original temperature of 200°C. If it loses heat of 801.36 kJ, find final temperature of casting. (Given : Specific Heat of Casting Material = 477 J/kgk). **[05]**

OR

Q.2) (A) Explain First Law of Thermodynamics with an example. **[05]**

(B) State steady flow energy equation, explain various terms and convert it for nozzle application. **[05]**

(C) Define and explain : PMMI, Isothermal Process, Enthalpy. **[06]**

Q.3) (A) Draw neat sketch and name various parts of a Refrigerator Cycle. **[06]**

(B) State applications of Compressed Air. **[05]**

(C) State classification of Boiler. **[05]**

OR

Q.4) (A) Compare 2-stroke and 4-stroke IC Engine. **[05]**

(B) List any four mounting of Boiler and state their functions. **[05]**

(C) Draw sketch and explain Centrifugal Pump. **[06]**

Q.5) (A) Describe Hydroelectric Plant with sketch. **[06]**

(B) What is Fin ? Explain types of Fin and list its applications. **[06]**

(C) What is Counter Flow and Parallel Flow Heat Exchanger ? **[06]**

OR

Q.6) (A) Describe Nuclear Power Plant with sketch. **[06]**

(B) Derive expression for heat conduction through composite slab. **[06]**

(C) What is Insulator ? Why they are needed ? State name of Insulators. **[06]**

SECTION - II

Q.7) (A) How drilling machines are classified ? **[05]**

(B) Draw only sketch and show various parts of Lathe Machine. **[06]**

(C) Compare Soldering and Brazing. **[05]**

OR

Q.8) (A) Explain arc welding with its applications. **[05]**

(B) State advantages of CNC Machine. **[05]**

(C) Compare Power Sawing and Hand Sawing with its applications. **[06]**

Q.9) (A) State and explain any three modes of failure used in Design. **[06]**

(B) State factors considered for selection of material. [**05]**

(C) What are ergonomic considerations of Design ? **[05]**

OR

Q.10) (A) Explain Limits and Tolerance with sketch. **[06]**

(B) Compare hot and cold working of Metal. **[05]**

(C) What are Aesthetic Considerations ? **[05]**

Q.11) (A) Compare Individual and Group Drive. **[06]**

(B) Explain any one type of Clutch with sketch. **[06]**

(C) Explain Flexible Coupling with sketch. **[06]**

OR

Q.12) (A) Compare Belt and Gear Drive. **[06]**

(B) Explain various types of Keys. **[06]**

(C) What is Flywheel ? State its use and applications. **[06]**

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