

Total No. of Questions : 12]

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[3761]-13

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.

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### 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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