Total No. of Questions : 8]

SEAT No. :

P543

[Total No. of Pages : 2

[4456] - 114
F.E. (Semester - I)
BASIC MECHANICAL ENGINEERING
(2012 Course)

Time : 2 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Assume suitable data, if necessary.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Use of Calculator is permitted.***
4) ***Solve Q1. or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q7. or Q.8.***

Q1) a) Explain different types of Shafts. What is difference between a Shaft and an Axle. **[6]**

b) Define the following properties of materials. **[6]**

i) Elasticity.

ii) Fatigue.

iii) Toughness.

iv) Malleability.

v) Brittleness.

vi) Creep.

OR

Q2) a) Compare Flat Belt Drive and V Belt Drive. **[4]**

b) Write a note on Ball Bearing. **[4]**

c) State general properties and engineering applications of following materials (any two): **[4]**

i) Plain Carbon Steel.

ii) Aluminium.

iii) Copper and its alloy.

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Q3) a) What is Sand Casting? Explain its advantages, disadvantages and applications. **[7]**

b) Write a note on Cylindrical Grinding and Surface Grinding. **[6]**

OR

Q4) a) Draw the block diagram of a lathe machine and explain the function of various parts. **[7]**

b) Draw self-explanatory sketches of any three; Sheet-metal cutting and any three; Sheet-metal forming operations. **[6]**

Q5) a) Define: **[4]**

i) Heat Source.

ii) Heat Sink.

iii) Thermal Efficiency.

iv) COP; Coefficient of Performance.

b) Write a note on pressure measurement. **[4]**

c) An engine develops 80kW of work output when heat is supplied at the rate of 240 kW. Find the efficiency of the engine and heat rejected to atmosphere. Draw the sketch of System. **[5]**

OR

Q6) a) Explain with example. **[4]**

i) Closed System.

ii) Open System.

b) State and explain Second Law of Thermodynamics. **[4]**

c) A U tube manometer connected to pipe carrying oil, shows a reading of 40cm of mercury. Find the absolute pressure of oil in the pipe if barometer reading is 10m of water.

Assume : Density of mercury ρ_{Hg} = 13600 kg/m^3, g = 9.81 m/s^2. **[5]**

Q7) a) Explain working of thermal power plant with neat sketch. **[6]**

b) Explain principle of working of four stroke spark ignition engine with neat sketches. **[6]**

OR

Q8) a) Draw a layout of nuclear power plant and explain the energy extraction. **[4]**

b) Compare Two Stroke and Four Stroke Engine Cycle. **[4]**

c) With neat sketch, explain working of Household Refrigerator. **[4]**