2E3206

Roll No. _____ [Total No. of Pages : 2

# 2E3206

## B.Tech. II Sem (Main) Examination, July - 2022
## 2FY3-07 Basic Mechanical Engineering

**Time : 3 Hours** **Maximum Marks : 70**

***Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.***

*Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205).*

### PART - A
**(Answer should be given up to 25 words only)**

Attempt **ALL** questions are compulsory. **(10×2=20)**

1. What is industrial engineering? Write its scope. **(2)**
2. Explain the adiabatic system with suitable example. **(2)**
3. Describe Zeroth law of thermodynamics. **(2)**
4. Define steam boilev and write different types of boiler. **(2)**
5. Define blade velocity coefficient. **(2)**
6. Define toughness and brittleness. **(2)**
7. What do you understand by chamfering and Baring. **(2)**
8. What is pattern in casting process? **(2)**
9. What are different types of belt drives? **(2)**
10. What is the difference between efficiency and Co-efficient of performance. **(2)**

## PART - B

### (Analytical/Problem solving questions)

Attempt any **Five** questions: **(5×4=20)**

1. Why cooling of I.C. Engines required? Describe briefly any one cooling method used in I.C. Engines. **(4)**

2. Write short note on comfort air conditioning. **(4)**

3. The distance between two bearing of a shaft which transmits 200 h.p. at 250 rpm is 250 cm. It is subjected to torsion only. Determine the diameter of the shaft for steady loading if the safe shear stress is 400 kg/cm$^2$. **(4)**

4. Derive an expression for the length of open belt drive. **(4)**

5. Differentiate between welding, braning and soldering processes. **(4)**

6. What is metal casting? Describe different methods of metal casting. **(4)**

7. Explain the various engineering materials properties. **(4)**

## PART - C

### (Descriptive/Analytical/Problem Solving/Design questions)

Attempt any **Three** questions: **(3×10=30)**

1. An engine, based on air standard Otto cycle, is supplied with air at 0.1 Mpa and 35° C. The compression ratio is 8. The heat supplied is 500 KJ/kg. for given working air specific heat capacity at constant pressure and at constant volume is 1.005 KJ/kgk, 0.718 KJ/kgk respectively find the following. **(10)**

   a) Efficiency of an engine

   b) Temperature and pressure at the end of compression

   c) Maximum temperature of the cycle.

2. What is meant by refrigeration system? Describe vapor compression refrigeration system with suitable diagram. **(10)**

3. Explain in detail, the various operations of drilling machine with diagrams. **(10)**

4. Explain the various stages of heat treatment process. **(10)**

5. A belt is running over a pulley of diameter 100 cm at 300 rpm. The angle of contact is 150° and coefficient of friction between the belt and pulley is 0.3. If the maximum tension in the belt is 3000 N, find the power transmitted by the belt. **(10)**

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