1E3107

Roll No.

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1E3107

B. Tech. I - Sem. (Main / Back) Exam., - 2025

1FY3-07 Basic Mechanical Engineering

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

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may 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)

1. NIL 2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1 Explain the open and close system.

Q.2 What is the function of foot valve in suction pipe?

Q.3 Difference between belt drive and rope drive.

Q.4 State the use of piston rings in IC Engines.

Q.5 Define Ton of refrigeration.

Q.6 Define mechanical energy and thermal energy.

Q.7 What are functioning difference between refrigeration and air conditioning system?

Q.8 Write the comparison between SI and CI engine.

Q.9 What is mechanical coupling?

Q.10 What is pump?

[5×4=20]

PART – B

(Analytical/Problem solving questions)

Attempt any five questions

Q.1 Write name of various types of power plants and explain any one in detail.

Q.2 Explain the working of 4-stroke diesel engine.

Q.3 Describe the construction and working of vapour absorption refrigeration system.

Q.4 Describe the metal casting process with suitable diagrams.

Q.5 Explain construction and working of a typical centrifugal pump with a sketch.

Q.6 Write the classification of engineering materials.

Q.7 Derive the expression for the length of belt for close belt drive.

[3×10=30]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 (a) Define heat treatment. Explain different stages of heat treatment with suitable diagram.

(b) Explain various types of engineering material's properties.

Q.2 Explain the following processes in details -

(i) Forging

(ii) Rolling

(iii) Drawing

(iv) Extrusion

Q.3 (a) Belt runs over a pulley of 800 mm diameter at the speed of 180 rpm, the angle of lap is 165° degree and the maximum tension in the belt is 2KN. Determine the power transmitted if the coefficient of friction between the belt and pulley is 0.3.

(b) Write the comparison between SI and CI engine.

(c) How do you classify steam generator? Explain with example.

Q.4 Write the classification of gear drives. Derive an expression for the tension ratio of belt tensions on the tight and slack side for flat and V-belt passing over a pulley in terms of coefficient of friction and angle of contact of belt over pulley.

Q.5 Explain the joining processes of soldering, brazing and welding. Clearly bring out the differences between them and give specific applications of each type.
