21507/11507

B. Tech. I/II Sem. (Main/Back) Exam., Dec. - 2019

ESC

2FY3-07 Basic Mechanical Engineering

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: *Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.*

Part – B: *Analytical/Problem Solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.*

Part – C: *Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.*

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

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

1. NIL

2. NIL

PART - A

Q.1 State the fundamental laws of thermal engineering. [2]

Q.2 In what applications Reciprocation pumps are used? [2]

Q.3 Differentiate between belt and rope drives. [2]

Q.4 What is the principle of Gas Cutting process? [2]

Q.5 What do you mean by relative humidity? [2]

PART – B

Q.1 Compare water tube and fire tube boilers. What are the different applications of boilers? [6+4=10]

Q.2 Explain the working of 2-storke petrol engine with the help of a neat diagram. [10]

Q.3 Derive an expression for the length of belt for an open belt drive. [10]

Q.4 Explain the working of a Centrifugal pump with the help of a neat sketch. [10]

Q.5 Briefly describe the different type of welding methods and their applications. [10]

Q.6 What are the main mechanical properties? Describe each in brief. [10]

PART – C

Q.1 An open belt drive connects two pulleys 120 cm and 50cm diameters, on parallel shafts 4m apart. The maximum tension in the belt is 1855.3 N, coefficient of friction is 0.3. The driver pulley of 120 cm diameter runs at 200 rpm, calculate:

(a) Power transmitted [5]

(b) Torque exerted on driven shaft [5]

(c) Belt length [5]

Q.2 (a) Describe the procedure for moulding with suitable sketches. [7]

(b) What are the different metal forming processes? Explain each of them. [8]

Q.3 Write brief notes on:

(a) Industrial Engineering [3]

(b) Impulse and Reaction turbines [3]

(c) Gear drive [3]

(d) Brazing and Soldering [3]

(e) Toughness and Resilience [3]