

<b>21507</b>	Roll No. _____	Total No of Pages: <b>4</b>
	<b>21507</b> <b>B. Tech. II Sem. (Main) / B. Tech. I Sem. (Back)</b> <b>Exam., May - 2019</b> <b>ESC</b> <b>2FY3-07 / 1FY3-07 Basic Mechanical Engineering</b>	

Time: 2 Hours

Maximum Marks: 80

**Instructions to Candidates:**

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

**Part – B:** Analytical/Problem solving questions  $4 \times 10$  marks = 40 marks. Candidates have to answer four questions out of six.

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

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

- Q.1 Explain Zeroth law of thermodynamics. [2]
- Q.2 Discuss difference between two and four stroke engine. [2]
- Q.3 Explain Principle of arc welding with diagram. [2]
- Q.4 Discuss difference between water tube and fire tube boilers. [2]
- Q.5 How cast iron differs from steel? [2]

**PART – B**

Q.1 What is a steam turbine? Explain the working principle of turbine with neat sketch. [10]

Q.2 What is an Internal Combustion engine? Give the classification of IC Engine and working also. [10]

Q.3 Explain the following terms : [10]

- (i) Ton of refrigeration
- (ii) Coefficient of performance
- (iii) Relative humidity
- (iv) Function of evaporator in refrigeration
- (v) Refrigerant

Q.4 Derive the expression for the length of belt for an open belt drive. [10]

Q.5 What are patterns? Name the various patterns. Explain the various pattern allowances. [10]

Q.6 Draw the diagram showing general classification of welding processes. Describe the principle of oxy-acetylene gas welding and mention its applications. [10]

**PART – C**

Q.1 (a) Following particulars refer to a petrol engine working on the Otto four cycle principle: [10]

Diameter of cylinder = 8.0 cm

Stroke (s) = 11.0 cm

Clearance volume = 80 cm<sup>3</sup>

I.H.P = 28.0 (20.59 kW)

Petrol consumption = 5.5 kg/hr

Calorific volume of fuel = 10,500 kcal/kg (43961.4 kJ/kg)

Calculate : <http://www.mgsuonline.com>

(a) Actual thermal efficiency

(b) Air standard efficiency

(c) Relative efficiency

(b) Compare SI and CI engine. [5]

Q.2 Explain the following manufacturing process in detail: [5×3=15]

(i) Green sand molding

(ii) Soldering and brazing

(iii) Forging

(iv) Drawing

(v) Extrusion

Q.3 (a) Two pulleys, one 450 mm diameter and other 200 mm diameter are on parallel shafts 2.00 m apart and are connected by a crossed belt. Find the length of the belt required. What power can be transmitted by the belt when larger pulley rotates at 200 rpm, if the maximum permissible tension in the belt is 100 kg, and the coefficient of friction between the belt and pulley is 0.25. [10]

(b) Explain the various types of engineering materials and their classification. [5]

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