

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2019**

**Course Code: EST 120**

**Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING**

**PART II: BASIC MECHANICAL ENGINEERING**

**(2019-Scheme)**

Max. Marks: 50

Duration: 90 min

**PART A**

*Answer all questions, each carries 4 marks.*

- 1 Draw the p-V diagram of a diesel cycle and define the terms (i) Compression ratio, (ii) Expansion ratio, and (iii) Cut-off ratio related to the Diesel cycle. (4)
- 2 With the help of a neat sketch show the important parts of an internal combustion engine. (4)
- 3 Define Cooling and Dehumidification .Also show the process in psychrometric chart. (4)
- 4 Differentiate between Impulse and Reaction turbine. Give examples for each type. (4)
- 5 Define the terms Rapid prototyping and Additive manufacturing. (4)

**PART B**

*Answer one full question from each module, each question carries 10 marks*

**Module-IV**

- 6 An engine working on Diesel cycle has diameter 150 mm and stroke 200 mm. The clearance volume is 10 % of the swept volume. Determine the compression ratio and air standard efficiency of the engine if the cut-off takes place at 6 % of the stroke. (10)

**OR**

- 7 a) Explain the MPFI system with block diagram. Also give its advantages (6)
- b) Give the concept of hybrid engines. (4)

**Module-V**

- 8 a) A centrifugal pump using 1kW of electric motor for pumping water against 3m suction head and 7m delivery head. The discharge of the pump is 100 liters /minute. Find the efficiency of pump. (5)
- b) Explain the open belt and cross belt drive in power transmission. Also give the applications. (5)

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OR

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- 9 a) A turbine is working at a head of 250 m and the discharge through the penstock is  $2 \text{ m}^3/\text{s}$ . If the efficiency of the turbine is 55 %, find the power developed by the turbine. (5)
- b) Explain the reversed Carnot cycle with PV Diagram. (5)

**Module-VI**

- 10 a) How the welding processes are classified? List out the different types of welding methods. (4)
- b) Explain the process of Arc welding with the help of a sketch. (6)

OR

- 11 Describe the working of a Milling machine. Draw the block diagram of a Milling machine and indicate its main parts. (10)

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