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

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

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

**Course Code: EST 120**

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

**PART I: BASIC CIVIL ENGINEERING**

**(2019-Scheme)**

Max. Marks: 50

Duration: 90 min

**PART A**

*Answer all questions, each carries 4 marks.*

- 1 Explain any two major disciplines of civil engineering.
- 2 What are the qualities of a good building stone?
- 3 Discuss the principles of surveying.
- 4 List out the criteria for the selection of a good roofing material.
- 5 Define bearing capacity of soil.

(5x4=20)

**PART B**

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

**Module-I**

- 6 a) Discuss the components of a residential building with a neat figure. (5)
- b) Explain the role of NBC, KBR and CRZ norms in building rules. (5)

**OR**

- 7 a) Discuss the requisites of a good site plan for a building. (5)
- b) List out any five major factors to be considered for the selection of a good site for a residential building. (5)

**Module-II**

- 8 a) Explain the types and uses of architectural glass as a construction material. (5)
- b) With sketches explain any five market forms of steel section and their uses. (5)

**OR**

- 9 a) List out any five major qualities of a good timber. (5)
- b) List out two uses of any five different types of cement. (5)

**Module-III**

- 10 a) With a neat sketch explain any two types of shallow foundation. (5)
- b) With neat sketches compare English bond and Flemish bond. (5)

**OR**

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- 11 a) Explain the water management and energy management in green buildings. (5)
- b) Discuss the civil engineering aspects of MEP and HVAC in a commercial building. (5)

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**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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- 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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