

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Second Semester B.Tech Degree Examination July 2021 (2019 scheme)

**Course Code: EST120**

**Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING**  
(2019 Scheme)

**PART I: BASIC CIVIL ENGINEERING**

Max. Marks: 50

Duration: 90 min

**PART A**

*Answer all questions, each carries 4 marks.*

- |   |   | Marks |
|---|---|-------|
| 1 | What are the responsibilities of an engineer in ensuring the safety of built environment? | (4)   |
| 2 | What are the principles of surveying?   | (4)   |
| 3 | List out the different varieties of timber available in Kerala.                           | (4)   |
| 4 | Differentiate between stretcher and header bond.  | (4)   |
| 5 | Write a note on ramp.   | (4)   |

**PART B**

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

**Module-I**

- |   |  |     |
|---|--|-----|
| 6 | a) Mention the factors to be considered while selecting the site for a building. | (5) |
|   | b) Draw a neat sketch showing important parts of a residential building.         | (5) |

**OR**

- |   |  |      |
|---|--|------|
| 7 | List out the major disciplines of civil engineering and explain their role in the infrastructural framework. | (10) |
|---|--|------|

**Module-II**

- |   |  |     |
|---|--|-----|
| 8 | a) Enumerate the physical and chemical properties of ordinary Portland cement. | (5) |
|   | b) Write a note on water proofing materials.                                   | (5) |

**OR**

- |   |   |      |
|---|---|------|
| 9 | List out the modern construction materials used for construction. Explain any four. | (10) |
|---|---|------|

**Module-III**

- |    |  |     |
|----|--|-----|
| 10 | a) Explain the circumstances where pile foundations are adopted. | (5) |
|    | b) Explain well foundation with neat sketch.                     | (5) |

**OR**

- |    |  |      |
|----|--|------|
| 11 | Explain various elements of a green building design. | (10) |
|----|--|------|

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**PART II: BASIC MECHANICAL ENGINEERING**

Max. Marks: 50

Duration:90 min

**PART A**

*Answer all questions, each carries 4 marks.*

Marks

- 12 What is meant by compression ratio? Why is it limited to 6 to 10 in petrol engines? (4)
- 13 With the help of a block diagram explain the CRDI system. (4)
- 14 Differentiate between comfort air conditioning and industrial air conditioning. (4)
- 15 Explain the concept of gear train ?Name important types of gear trains (4)
- 16 Explain how metals are joined in a village smithy shop. (4)

**PART B**

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

**Module-IV**

- 17 The minimum pressure and temperature in an Otto cycle are 100kPa and 300K.The compression ratio is 5 and the peak pressure is 2.1MPa Find out (1) Heat supplied /kg of air (2) Heat rejected/kg of air (3) Work done /kg of air (4) Theoretical thermal efficiency (5) Mean effective pressure (10)

**OR**

- 18 a) Explain the working of 4 stroke diesel engine with neat sketches. (6)
- b) Give the comparison between CI and SI engines. (4)

**Module-V**

- 19 a) With the help of a neat sketch, explain the working of a vapour compression refrigeration system? Also show the process in p-h and T-S diagrams. (8)
- b) Explain why Carnot refrigerator is not practically possible. (2)

**OR**

- 20 a) Differentiate between window air-conditioner and split air conditioner. (5)
- b) Explain the working of Francis turbine, also give the field of application. (5)

**Module-VI**

- 21 a) With a block diagram explain the processes involved in a CNC system. (6)
- b) How does welding differ from brazing and soldering processes? (4)

**OR**

- 22 Describe the working of a Drilling machine with the help of a block diagram and indicate its main parts. (10)

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