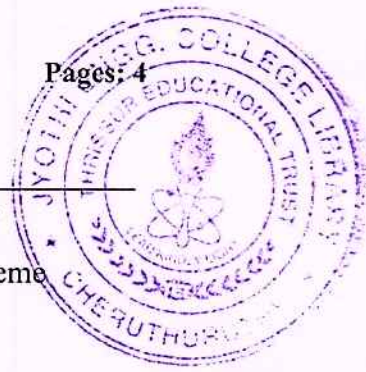


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S1 (S,FE) S2 (S,FE) Examinations May 2026 (2019 Scheme)



Course Code: EST120

Course Name: BASICS OF CIVIL AND MECHANICAL ENGINEERING

(2019 Scheme)

- Use separate answer sheets for Part 1 and Part 2
- No separate minimum marks are required to pass.

Max Marks: 100

Duration: 3 Hours

PART 1: BASIC CIVIL ENGINEERING

PART A

Answer all questions, each carries 4 marks

Marks

- | | | |
|---|--|-----|
| 1 | Discuss about Group A and Group C buildings as per NBC | (4) |
| 2 | Explain the principles of surveying | (4) |
| 3 | List down the uses of ceramics in construction | (4) |
| 4 | What is National Building Code? Classify buildings as per NBC of India | (4) |
| 5 | Discuss any four factors considered for selection of flooring. | (4) |

PART B

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

MODULE 1

- | | | |
|---|---|------|
| 6 | (a) Explain the classification of buildings based on occupancy as per NBC | (10) |
|---|---|------|

OR

- 7 (a) List the types of buildings as per occupancy according to Kerala Building rules. (10)
Explain any four.

MODULE 2

- 8 (a) Explain any five tests for proper quality control of bricks. (10)

OR

- 9 (a) Explain any 4 market forms of steel sections with neat sketches (10)

MODULE 3

- 10 (a) Explain, with neat sketches, the difference between English bond and Flemish bond. (10)

OR

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

PART 2: BASIC MECHANICAL ENGINEERING

PART A

Answer all questions, each carries 4 marks

Marks

- | | | |
|---|---|-----|
| 1 | Plot the P-V diagram of Otto cycle and Diesel cycle. List the processes involved. | (4) |
| 2 | List the advantages of using CRDI and MPFI technologies in modern vehicles. | (4) |
| 3 | Two mating spur gears A and B have 60 and 40 teeth respectively. Their common module is 5 mm. Determine the gear ratio and centre-to-centre distance between their gear axis if gear B is driven by gear A. | (4) |
| 4 | Compare casting and forging in manufacturing process. Mention few examples of commonly used cast and forged products. | (4) |
| 5 | List the advantages and applications of additive manufacturing. | (4) |

PART B

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

MODULE 4

- | | | |
|---|---|-----|
| 6 | (a) Explain the working cycle of four-stroke compression-ignition engine with neat schematic diagrams. Also mention any two main differences of it from spark-ignition engine. | (6) |
| | (b) In an Otto cycle, condition of air is 27°C and 1 bar at the beginning of compression. If the clearance volume is 20% of the swept volume, then find the temperature after compression and Air- standard efficiency. | (4) |

OR

- | | | |
|---|--|------|
| 7 | Explain the functions of lubricating system in I.C. engine. Compare Wet-sump and Dry-sump lubrication system with neat schematic diagrams. | (10) |
|---|--|------|

MODULE 5

- 8 (a) What is Air-conditioning? Explain the factors affecting human comfort Air-conditioning. (4)
- (b) Draw a neat lay-out of central type Summer Air-conditioning system and label its constructional parts. (6)

OR

- 9 Compare the working of single-acting and double-acting reciprocating pump with neat schematic diagrams. Also compare its features with a centrifugal pump. (10)

MODULE 6

- 10 (a) What is rolling in metal forming? Explain two-high and three-high rolling mill arrangements with neat sketches. (6)
- (b) Explain the use of flux coated consumable electrode used in SMAW. (4)

OR

- 11 Explain the working principle and parts of a Drilling Machine with a neat block diagram. Also explain any three operations that can be performed on it other than basic drilling with neat sketches. (10)
