Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Second Semester B.Tech Degree Regular and Supplementary Examination June 2023 (2019 Scheme)

Course Code: EST 120

Course Name: BASICS OF CIVIL AND MECHANICAL ENGINEERING

(2019 -Scheme)

PART 1: BASIC CIVIL ENGINEERING

Max. Marks: 50   Duration: 90 min

PART A

Answer all questions, each carries 4 marks   Marks

1   Define (a) Plinth Area (b) FAR (c) Built up Area (d) Carpet Area.   (4)

2   What are the principles of surveying? Explain.   (4)

3   What is the importance of bonding in brick masonry constructions?   (4)

4   What is National Building Code? Classify buildings as per NBC of India.   (4)

5   List any 4 types of timber, stating their use in building construction.   (4)

PART B

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

MODULE 1

6   What are the various components of a building? Briefly explain with a properly labelled, neat sketch.   (10)

OR

7   a   Discuss the points to be considered while selection of a site for building.   (5)

    b   How transportation engineering is relevant in the development of a country?   (5)

MODULE 2

8   Explain, with sketches, any 5 market forms of steel sections. State their uses in construction.   (10)

OR

9   a   State the properties of cement concrete.   (5)

    b   List five types of cement and their uses.   (5)

MODULE 3

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

OR

11   a   What is an escalator? How is it different from an elevator?   (4)

     b   Discuss any six types of flooring materials.   (6)

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PART 2 : BASIC MECHANICAL ENGINEERING

Max. Marks: 50   Duration: 90 min

PART A
Answer all questions, each carries 4 marks   Marks

12	What are the important assumptions made in arriving at air standard cycle?	(4)
13	Write short note on hybrid engines.	(4)
14	How does a central air conditioning system vary from a unitary system?	(4)
15	What are the advantages and disadvantages of gear drives?	(4)
16	What is rapid prototyping? Write its advantages.	(4)

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

MODULE 4

17 a   Explain various processes involved in a Carnot cycle with P-V and T-S diagram   (5)

   b   An Engine working on Otto cycle takes in air at a pressure and temperature of   (5)
       100 kPa and 300 K. Find out the air standard efficiency of the engine if the
       clearance volume of the engine is 16% of the cylinder volume. Also find the
       maximum pressure of the cycle, if the maximum temperature is limited to 600^{0}C

OR

18 a   Explain the working of two stroke SI engine with a neat sketch.   (6)

   b   With the help of a block diagram, explain the fuel and air systems of SI engine.   (4)

MODULE 5

19 a   Explain the working of vapour compression refrigeration system with a neat   (6)
       sketch.

   b   Explain the desirable properties of a good refrigerant.   (4)

OR

20 a   Explain the working of Pelton turbine with a neat sketch   (6)

   b   A centrifugal pump discharges water at a rate of 300 litres/minute against a head   (4)
       of 20 m when running at 300 rpm. Calculate the power required to run the pump
       if the overall efficiency of the pump is 50 %.

MODULE 6

21   What is casting? With the help of a neat sketch, explain the process of sand   (10)
     mould casting. Write any two applications of casting.

OR

22   Explain the components of a Drilling machine with a neat diagram. List out the   (10)
     operations performed in it.

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