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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Second Semester B.Tech Degree (S, FE) Examination January 2024 (2019 Scheme)

Course Code: EST 120

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

**PART 1 : BASIC CIVIL ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 4 marks*

Marks

- 1 Explain built up area and Floor area ratio (FAR). (4)
- 2 Discuss the qualities of a good building stone. (4)
- 3 List down the uses of ceramics in construction. (4)
- 4 Define (a) Ultimate bearing capacity of soil (b) Safe bearing capacity of soil. (4)
- 5 Discuss the functions of MEP. (4)

**PART B**

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

**MODULE 1**

- 6 a Discuss any five factors to be considered in the selection of site for a residential building. (5)
- b Explain the role of NBC and CRZ norms in building rules and regulations prevailing in our country. (5)

**OR**

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

**MODULE 2**

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

**OR**

- 9 a Explain the principles of surveying with neat sketches. (5)
- b List the characteristics of a good timber. (5)

**MODULE 3**

- 10 Draw the elevation and plan of one and a half brick thick wall with English bond. (10)

**OR**

- 11 a Explain any two types of shallow foundation with the help of neat sketches. (5)
- b Compare the water management systems in conventional and green buildings. (5)

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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 | Why cooling system is necessary in an IC engine?  | (4)   |
| 13 | Explain the functions of following parts in an IC engine i) Piston ii) Connecting rod iii) Crank iv) Spark plug | (4)   |
| 14 | Why closed bottles which contain cold water sweats when placed at room temperature? Explain the concept         | (4)   |
| 15 | What is priming in centrifugal pumps  | (4)   |
| 16 | Describe the concepts of Rapid prototyping and Additive manufacturing.  | (4)   |

**PART B**

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

**MODULE 4**

- 17 Draw a neat figure of MPFI engine and explain its working. What are the advantages of MPFI engine over conventional petrol engines? (10)

**OR**

- 18 i) With the help of a figure explain the working of a water cooling system in IC engines? (7)  
ii) Explain the type of lubrication system used in a 2 stroke engine? (3)

**MODULE 5**

- 19 Discuss any three types of gear trains (10)

**OR**

- 20 With the help of neat diagram explain the construction and working of Pelton wheel turbine (10)

**MODULE 6**

- 21 With block diagram explain the working of a lathe? List down various operations performed in a lathe. (10)

**OR**

- 22 (a) Define the following operations (6)  
(i) Casting  
(ii) Forging  
(iii) Rolling  
(b) List the advantages of CNC machines? (4)

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