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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

First Semester B.Tech Degree Regular and Supplementary Examination December 2022 (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 Explain (a) Plinth area, (b) built-up area, (c) floor area, (d) floor area ratio (FAR) for a building as per Kerala Building Rules (KBR). (4)

2 What are the norms of Coastal Regulatory Zone (CRZ)? (4)

3 State the objectives of Surveying. (4)

4 Compare combined footing and isolated column footing based on nature of construction site. (4)

5 Explain the civil engineering aspects of escalators and ramps. (4)

PART B

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

MODULE 1

6 a) What are the major disciplines of civil engineering? (4)

b) Classify buildings based on National Building Code (NBC) of India. (6)

OR

7 Explain the functions of various components of a residential building. (10)

MODULE 2

8 a) List out any two examples for prefabricated building components stating any two advantages of using them in construction. (4)

b) Classify bricks, and explain the characteristics of each type. (6)

OR

9 a) Differentiate plain cement concrete and reinforced cement concrete. (4)

b) Explain the types of rolled steel sections and steel reinforcements. (6)

MODULE 3

10 a) Define the terms in the context of brick masonry - (a) frog, (b) perpend, (c)Quoin, and (d) bond (4)

b) Sketch the plan of odd and even courses and elevation of one brick thick English bond wall. (6)

OR

11 a) Select a suitable floor covering material and roof covering material for a warehouse storing chemicals. State valid reasons for your selection. (4)

b) What is a green building? What are the main characteristics of a green building? (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 Write notes on hybrid vehicles. (4)

13 What is mean by priming of a pump? Why is it necessary in a centrifugal pump? (4)

14 What are the different types of gears used in power transmission? (4)

15 Briefly describe rolling process. (4)

16 Explain the Additive manufacturing. (4)

PART B

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

MODULE 4

17 In an air standard diesel cycle, the compression ratio is 16 and at the beginning of compression the temperature is 15°C and the pressure is 0.1 MPa. Heat is added until the temperature at the end of the constant pressure process is 1480°C. Calculate (10)

(i) cut-off ratio

(ii) Heat supplied per kg. of air

(iii) Work done per kg. of air

(iv) Efficiency of the cycle.

Take Assume Cp = 1.005 kJ/kg. K and Cv = 0.718 kJ/kg. K.

OR

18 a) Explain the working of four stroke petrol engine with neat sketches. (8)

b) How does a two stroke engine differ from four stroke engine? (2)

MODULE 5

19 With the help of flow and p-h diagram explain the working of a vapour compression refrigeration system. (10)

OR

20 Explain with a neat sketch, the working of Kaplan turbine. (10)

MODULE 6

21 Explain the production processes:- (10)

(i) Turning

(ii) Arc welding

(iii) Extrusion

(iv) Forging

OR

22 Explain the elements of CNC systems with block diagram. List the advantages of CNC machines. (10)

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