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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION(2019 scheme), DECEMBER 2019

Course Code: EST 120

Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING

PART I: BASIC CIVIL ENGINEERING

(2019-Scheme)

Max. Marks: 50 Duration: 90 min

PART A

Answer all questions, each carries 4 marks.

1 Explain any two major disciplines of civil engineering.

2 What are the qualities of a good building stone?

3 Discuss the principles of surveying.

4 List out the criteria for the selection of a good roofing material.

5 Define bearing capacity of soil. (5x4=20)

PART B

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

Module-I

6 a) Discuss the components of a residential building with a neat figure. (5)

b) Explain the role of NBC, KBR and CRZ norms in building rules. (5)

OR

7 a) Discuss the requisites of a good site plan for a building. (5)

b) List out any five major factors to be considered for the selection of a good site for a residential building. (5)

Module-II

8 a) Explain the types and uses of architectural glass as a construction material. (5)

b) With sketches explain any five market forms of steel section and their uses. (5)

OR

9 a) List out any five major qualities of a good timber. (5)

b) List out two uses of any five different types of cement. (5)

Module-III

10 a) With a neat sketch explain any two types of shallow foundation. (5)

b) With neat sketches compare English bond and Flemish bond. (5)

OR

11 a) Explain the water management and energy management in green buildings. (5)

b) Discuss the civil engineering aspects of MEP and HVAC in a commercial building. (5)

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Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING

PART II: BASIC MECHANICAL ENGINEERING

(2019-Scheme)

Max. Marks: 50 Duration: 90 min

PART A

Answer all questions, each carries 4 marks.

1		Draw the p-V diagram of a diesel cycle and define the terms (i) Compression ratio, (ii) Expansion ratio, and (iii) Cut-off ratio related to the Diesel cycle.	(4)
2		With the help of a neat sketch show the important parts of an internal combustion engine.	(4)
3		Define Cooling and Dehumidification .Also show the process in psychrometric chart.	(4)
4		Differentiate between Impulse and Reaction turbine. Give examples for each type.	(4)
5		Define the terms Rapid prototyping and Additive manufacturing.	(4)

PART B

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

Module-IV

6		An engine working on Diesel cycle has diameter 150 mm and stroke 200 mm. The clearance volume is 10 % of the swept volume. Determine the compression ratio and air standard efficiency of the engine if the cut-off takes place at 6 % of the stroke.	(10)

OR

7	a)	Explain the MPFI system with block diagram. Also give its advantages	(6)
	b)	Give the concept of hybrid engines.	(4)

Module-V

8	a)	A centrifugal pump using 1kW of electric motor for pumping water against 3m suction head and 7m delivery head. The discharge of the pump is 100 litters /minute. Find the efficiency of pump.	(5)
	b)	Explain the open belt and cross belt drive in power transmission. Also give the applications.	(5)

OR

9 a) A turbine is working at a head of 250 m and the discharge through the penstock is 2 m^3/ s. If the efficiency of the turbine is 55 % , find the power developed by the turbine. (5)

b) Explain the reversed Carnot cycle with PV Diagram. (5)

Module-VI

10 a) How the welding processes are classified? List out the different types of welding methods. (4)

b) Explain the process of Arc welding with the help of a sketch. (6)

OR

11 Describe the working of a Milling machine. Draw the block diagram of a Milling machine and indicate its main parts. (10)

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