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**SAINTGITS COLLEGE OF ENGINEERING
 KOTTAYAM, KERALA**

 (AN AUTONOMOUS COLLEGE AFFILIATED TO
 APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2022
Course Code: 20EST120
Course Name: BASICS OF CIVIL AND MECHANICAL ENGINEERING
Max. Marks: 100
Duration: 3 Hours
PART I BASIC CIVIL ENGINEERING
Part I to be answered in pages 1 to 15
PART A
(Answer all questions. Each question carries 4 marks)

1. Define (a) Built up area (b) Floor area.
2. Explain the objectives of surveying.
3. List out any four major qualities of a good timber.
4. Explain any four functions of foundation.
5. Differentiate between Elevators and Escalators.

(5x4=20)

PART B
(Answer one full question from each module, each question carries 10 marks)
MODULE I

6. a) Explain the responsibility of an engineer in ensuring the safety of built environment. (5)
- b) List out the major disciplines of civil engineering and explain any two. (5)

OR

7. a) What are functions of (a) doors, (b) lintel, and (c) roof in a building? (5)
- b) Explain the relevance of NBC and CRZ norms in building rules and regulations prevailing in India. (5)

MODULE II

8. a) List out the uses of steel in building construction. (5)
- b) Discuss in detail about the modern uses of gypsum. (5)

OR

9. a) Explain the constituents of concrete. Differentiate between PCC and RCC. (5)
- b) List and explain any four modern construction materials used for construction. (5)

MODULE III

10. a) Draw neat sketch of the following foundations: (i) Wall footing; and (ii) Combined footing. (5)
- b) List out the types of roofing materials available. Explain any two of them. (5)

OR

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11. a) Draw the plan and elevation of header bond and stretcher bond with 40cm height and 80cm length. (5)
b) Explain the energy systems and water management in Green buildings. (5)

PART II BASIC MECHANICAL ENGINEERING

Part II to be answered in pages 16 to 30

PART C

(Answer all questions. Each question carries 4 marks)

12. Compare two stroke and four stroke engines.
13. Write note on various Lubricating systems in IC engines.
14. What are the desirable properties of a good refrigerant?
15. Write short note on different types of gears used in power transmission?
16. Distinguish between brazing and welding.

PART D

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

MODULE IV

17. a) Calculate the ideal air standard cycle efficiency based on the Otto cycle for a gas engine with a cylinder bore of 50 mm, a stroke of 75 mm and a clearance volume of 21.3 cm³. (6)
b) Define compression ratio. Why compression ratio of petrol engine is low compared to diesel engines? (4)

OR

18. Explain the working of 4 stroke Diesel engine with diagram. (10)

MODULE V

19. Explain the working of vapour compression refrigeration system with diagram. (10)

OR

20. a) Explain the working of Francis turbine with sketch. (7)
b) What is the role of draft tube in a reaction turbine? (3)

MODULE VI

21. Explain forging process. With suitable diagrams discuss any four forging operations. (10)

OR

22. a) Explain any four operations that can be performed on a lathe. (4)
b) Compare up milling and down milling process with neat sketches. (6)
