Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (S), AUGUST 2023

(2020 SCHEME)

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. Differentiate between plinth area and carpet area.
2. Enlist the purposes of surveying.
3. Explain the qualities of good cement.
4. Explain bearing capacity. What is its significance in foundations?
5. What is the importance of green building ?

PART B

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

MODULE I

6. a) List out the types of building as per occupancy. Explain any two with examples. (5)
   b) Describe the components of building with a neat figure. (5)

OR

7. a) What are the factors to be considered while selecting site for a residential building? (5)
   b) Explain the role of NBC, KBR and CRZ norms in building construction prevailing in our country. (5)

MODULE II

8. a) Explain any five properties of bricks. (5)
   b) Sketch any three steel sections and mention it's uses. (5)

OR

9. a) Explain different types of concrete. (5)
   b) List and explain any five modern construction materials . (5)

MODULE III

10. a) Draw the elevation and plan of one brick thick wall in English bond. (5)
    b) Briefly discuss shallow and deep foundations. (5)

OR

11. a) What are the requirements of an ideal roof? Explain any two types of roofing materials. (5)
    b) Write short note on 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 A

(Answer all questions. Each question carries 4 marks)

12. What are the functions of lubrication system in an IC engine?
13. Compare SI and CI engines.
14. What you mean by 1 Ton of refrigeration?
15. Compare open and cross belt drives.
16. What you mean by additive manufacturing?

PART B

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

MODULE IV

17. a) With the help of P-V and T-S diagram, derive the expression for the air standard efficiency of carnot cycle. (7)
    b) Define thermal and mechanical efficiencies of an IC engine. (3)

OR

18. a) With suitable sketch, explain the working of a 2-stroke spark ignition engine. (7)
    b) Differentiate between air-cooled and water-cooled engines. (3)

MODULE V

19. a) With suitable diagram, explain the working of a vapour compression refrigeration system. (7)
    b) What are the main differences between a spur gear and a helical gear? (3)

OR

20. a) With suitable sketch, explain the working of a reciprocating pump. (7)
    b) Explain the terms (i) DBT (ii) WBT (iii) DPT (3)

MODULE VI

21. a) Explain different types of rolling mills with suitable diagram. (5)
    b) With neat sketches explain direct and indirect extrusion. (5)

OR

22. a) With suitable diagram, explain arc welding process. (5)
    b) Draw and label the parts of a machine tool which can be used to create holes in a rectangular workpiece. (5)

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