

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (S), SEPT 2022**(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. Discuss the important aspects of a site to be considered for constructing a residential building.
2. Explain the qualities of a good stone.
3. Explain the principles of surveying.
4. Discuss the civil engineering aspects of MEP in a commercial building.
5. Differentiate between load bearing and framed structures.

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

6. a) Explain the effects of infrastructure development on economy of the country. (4)
b) Explain the components of a residential building with the help of a neat sketch. (6)

OR

7. a) Explain the role of NBC and KBR norms in building rules. (4)
b) Define (a) Plinth area (b) Carpet area (c) FAR (6)

MODULE II

8. a) Discuss any four modern construction materials used for construction. (4)
b) Explain the qualities of good sand. (6)

OR

9. a) Explain any four market forms of steel. (4)
b) Explain the field tests on cement for checking the quality of cement. (6)

MODULE III

10. a) Explain the functions of foundation in building. (4)
b) Explain the civil engineering aspect of elevators and escalators. (6)

OR

11. a) Differentiate between English bond and Flemish bond. (4)
b) Explain energy systems and water management systems in green buildings. (6)

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. State the Zeroth law of thermodynamics. Give examples.
13. Write short notes on (i) CRDI and (ii) MPFI Engines
14. The door of your refrigerator is kept open inside a room. What will happen? Justify your answer.
15. How is Up-milling different from Down-milling operation?
16. What is additive manufacturing? List its advantages.

PART D*(Answer one full question from each module, each question carries 10 marks)***MODULE IV**

17. a) What are air standard cycles? (2)
b) With proper PV diagram, derive an expression to represent the efficiency of Carnot cycle (8)

OR

18. a) Sketch the Pressure-Volume diagrams of Otto and Diesel Cycle and mark the thermodynamic processes on it. (4)
b) An engine operating on Carnot cycle between the temperatures limits 20°C and 800°C rejects heat at a rate of 200KJ/s. (6)
Determine the (i) ideal thermal efficiency and (ii) Power output of engine.

MODULE V

19. a) With a neat sketch explain the working principle of a vapour compression refrigeration system (8)
b) List at least two differences between Open belt and Cross belt drive (2)

OR

20. a) Explain the working principle of a reciprocating pump (neat diagram is mandatory). (8)
- b) What are the various power transmission devices to transmit mechanical power (2)

MODULE VI

21. a) What is rolling? What are the various types of rolling mills? (8)
- b) List the properties of a good moulding sand (2)

OR

22. a) With a neat sketch explain the working of lathe machine. (6)
- b) Differentiate between CAD and CAM (4)
