

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 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. Explain relevance of Civil Engineering in overall infrastructural development of the country.
2. Describe the disciplines Water Resources Engineering and Environmental Engineering in Civil Engineering.
3. List the uses of following building materials: (i) Stone (ii) Cement.
4. Differentiate elevators and escalators.
5. Discuss the relevance of Green Buildings in society.

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

OR

7. a) Define the terms: (i) Plinth area (ii) Carpet area (iii) Built up area (iv) Floor area (v) Floor area ratio. (5)
b) Explain the role of CRZ norms in building rules and regulations prevailing in our country. (5)

MODULE II

8. a) Explain the principles of surveying. (5)
b) Describe the classification of bricks as per Indian Standards. (5)

OR

9. a) Describe any five steel sections with figure. (5)
b) Describe thermal and acoustic insulating materials used in buildings. (5)

MODULE III

10. a) Enumerate the functions of foundations. (5)
 b) Explain water management systems in Green building. (5)

OR

11. a) Draw the elevation and plan of header and stretcher bond. (5)
 b) Describe any five types of roofing materials. (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. Sketch the P-V and T-S diagram of an Otto cycle, list the processes.
 13. Draw and label the parts of a single acting reciprocating pump.
 14. Explain the terms: (i.) Refrigerating Effect, (ii.) One ton of refrigeration
 15. Differentiate between direct and indirect extrusion processes.
 16. With necessary diagrams, list the operations that can be performed on a milling machine.

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

17. In a constant volume Otto cycle, the pressure at the end of compression is 15 times that at the start, the temperature of air at the beginning of compression is 38 °C and maximum temperature attained in the cycle is 1950 °C. Represent the points on a P-V and T-S diagram. Determine (i.) compression ratio (ii.) thermal efficiency of the cycle (iii.) work done per kg of air. Take $\gamma = 1.4$ and $C_v = 0.718$ kJ/kgK for air. (10)

OR

18. a) With the help of necessary schematic diagrams explain the working of a 4-stroke petrol engine. (7)
 b) Explain the MPFI system with block diagram. (3)

MODULE V

19. a) With the help of neat sketch, explain vapor compression refrigeration system. (7)
 b) Explain the terms: (i.) Dry and wet bulb temperature, (ii.) Relative humidity. (3)

OR

20. a) With the help of a neat sketch explain the working of a Pelton turbine. (6)
 b) Explain the different types of gear trains with neat diagrams. (4)

MODULE VI

21. a) Explain the desirable properties of moulding sand used in sand casting. (5)
- b) Explain the different types of rolling mills with neat sketches. (5)

OR

22. a) With a neat block diagram explain the working of a drilling machine. (10)
