

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (REGULAR), JULY 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. List out the types of building as per occupancy.
2. Explain the relevance of KBR and CRZ norms.
3. Explain the principles of surveying.
4. List and explain the different grades of cement.
5. Differentiate between elevators and escalators.

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

6. a) List any six factors to be considered while selecting the site for a residential building. (3)
- b) Explain the components of a residential building with a neat sketch. (7)

OR

7. a) Define the terms: carpet area, plinth area, covered area and floor area ratio. (4)
- b) What are the major disciplines in Civil Engineering and explain any two in detail? (6)

MODULE II

8. a) Explain the constituent materials in cement concrete. (4)
- b) Describe the qualities of good bricks. (6)

OR

9. a) Give a brief description about any four modern construction materials. (4)
- b) Explain different types of structural steel sections available in market. (6)

MODULE III

10. a) Draw the plan and elevation of one and a half brick thick English bond. (4)
b) Discuss any three types of floor finishing materials. (6)

OR

11. a) What is shallow foundation? Explain cantilever footing and raft foundation with figure. (5)
b) Explain the energy systems 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. Sketch the P-V diagram of a Carnot cycle and list the four thermodynamic processes associated with it.
13. State the significance of lubricating systems in IC engines
14. Explain the terms: (i) Refrigerating Effect and (ii) One Ton of refrigeration
15. What are impulse turbines? Give examples.
16. List the various operations that can be performed on a lathe?

PART D*(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. With the help of necessary schematic diagrams, explain the working of a Four-stroke diesel engine. (10)

MODULE V

19. a) With the help of neat sketch, explain the Vapor compression refrigeration system. (8)
b) Explain the terms: (i.) Specific humidity, (ii.) Relative humidity. (2)

OR

20. a) With neat diagrams, explain the working principle of a single acting reciprocating pump. (5)
b) Compare belt drive and chain drive system. (5)

MODULE VI

21. a) Explain the desirable properties of a good moulding sand used in sand casting. (5)
b) Write short notes on any two types of rolling mills. (5)

OR

22. a) List the basic forging operations (2)
b) Explain the basic working principle of a radial drilling machine with a neat sketch. (8)
