

Register No.: Name:



**SAINTGITS COLLEGE OF ENGINEERING
KOTTAYAM, KERALA**

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

FIRST SEMESTER B.TECH DEGREE EXAMINATION(S), JULY 2021

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. Describe any four criteria that should be followed for selecting a site for building construction purpose.
2. Explain
 - a. Plinth area
 - b. Floor area
 - c. Floor area ratio
3. Explain the principles of surveying.
4. Compare the properties of first class and second-class bricks.
5. Differentiate terrazzo floor covering from mosaic floor covering.

PART B

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

MODULE I

6. a) Summarize the classification of buildings based on occupancy. Describe any two groups with examples. (6)
- b) Explain the role of a civil engineer in the infrastructural development of a country. (4)

OR

7. With a neat sketch, explain the components of a building. (10)

MODULE II

8. a) Discuss the following qualities of cement:
 - a. Compressive strength
 - b. Consistency
 - c. Setting time (6)
- b) Explain any four-market form of steel with neat sketch. Also describe their uses. (4)

OR

9. a) List out the ingredients of cement concrete. Discuss the properties of any two ingredients of cement concrete. (5)
- b) List and explain any five properties of timber. (5)

MODULE III

10. a) Draw the figures of the following shallow foundations.
 - a. Isolated sloped footing.
 - b. Inverted arch footing.
 - c. Combined footing. (6)
- b) Compare the properties of different types of roofs provided for buildings. (4)

OR

11. a) Draw the plan and elevation of a one brick thick English bond. (6)
- b) Describe the functioning of energy systems in green buildings. (4)

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. What are the desirable properties of a good lubricant?
13. Describe the importance of priming in centrifugal pumps.
14. Which type of gears are used to connect non-parallel shafts with intersecting axes. Explain the geometry with simple sketch
15. What is additive manufacturing? List any two examples.
16. What is extrusion? List its applications?

PART D

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

MODULE IV

17. a) A Carnot engine has an efficiency of 30%. Its efficiency is to be increased to 50%. By what must the temperature of the source be increased if the sink is at 300 K? (7)
- b) What are the advantages of air-cooling system in engines (3)

OR

18. a) With neat sketches explain the working of a 4-stroke spark ignition engine. (7)
- b) Why two stroke engine has lower overall efficiency as compared to that of four stroke engine. (3)

MODULE V

19. Explain the working of centrifugal pump with neat figure. (10)

OR

20. a) With a neat sketch explain the working of a Pelton turbine. (5)
- b) Explain any one type of gear train based on the arrangement of gears. (5)

MODULE VI

21. a) With suitable sketches, explain the types of rolling mills used in rolling process. (6)
- b) Compare and contrast soldering and brazing. (4)

OR

22. a) With neat sketch, explain the arc welding process. (5)
- b) Explain the functioning of a CNC machine with suitable block diagram. (5)
