

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER B.TECH DEGREE EXAMINATION (S), FEBRUARY 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. What are the responsibilities of a civil engineer in ensuring the safety of a built environment?
2. Explain the constituent materials in cement concrete.
3. Describe about any four structural steel sections.
4. Differentiate English bond and Flemish bond in brick masonry.
5. Discuss the civil engineering aspect of HVAC system in buildings.

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

6. a) List out the types of building based on occupancy. (4)
b) Discuss the components of residential building with a neat sketch. (6)
Explain the functions of foundation, lintel and damp proof course.

OR

7. a) Define Plinth area and built up area (4)
b) Mention the different disciplines of Civil Engineering. Explain in detail Structural Engineering and Geotechnical Engineering. (6)

MODULE II

8. a) What are the qualities of good building stones? (4)
b) Explain the objectives and principles of surveying. (6)

OR

9. a) List and explain different grades of cement. (4)
b) Give a short description about any three modern construction materials. (6)

MODULE III

10. a) Draw the plan and elevation of one brick thick English bond. (4)

- b) Discuss any three types of roofing materials. (6)

OR

11. a) What are shallow foundations? Explain the situation in which raft foundations are provided. (4)
- b) Explain the energy and water management system 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. Draw the P-V diagram for a Carnot Cycle and mark the processes in it.
13. Explain the concept of Hybrid engines.
14. On the basis of inward and outward flow, how the turbines are classified?
15. How Open belt drive is different from Cross belt drive?
16. What is additive manufacturing?

PART D

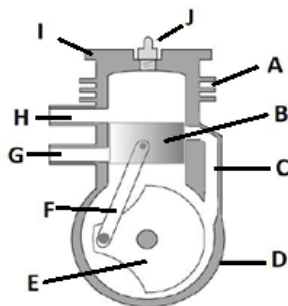
(Answer one full question from each module, each question carries 10 marks)

MODULE IV

17. a) What are Air standard cycles? List the assumptions made in Air Standard cycles. (5)
- b) The compression ratio of an engine working on Otto cycle is 8.5:1. (5)
The temperature and pressure at the beginning of compression are 93°C and 0.93 bar respectively. The maximum pressure in the cycle is 38 bar. Determine the temperature and pressure at the salient points of the cycle and air standard efficiency.

OR

18. a) Identify the parts of a two-stroke petrol engine and mark at least eight terminologies against each of the codes. (2)



Code	Terminology
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	

- b) Explain the working of four stroke petrol engine with neat figures. (8)

MODULE V

19. a) Define one ton of refrigeration. (2)
b) Explain the working of vapour compression refrigeration cycle. (8)

OR

20. a) Define the terms: (i) dry bulb temperature (ii) relative humidity (2)
b) Explain the working of a centrifugal pump with neat figure. (8)

MODULE VI

21. a) Draw the block diagram of a lathe machine and mark the main parts. (8)
b) List the different types of rolling mills (2)

OR

22. a) Give the full forms of the following abbreviations (2)
(i) CAD (ii) CAM (iii) CIM (iv) CNC
b) Draw the block diagram of a radial drilling machine and label the main parts (8)
