

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION (R,S), MAY 2024

COMMON TO CE,CH,FT,ME

(2020 SCHEME)

Course Code : 20EST200

Course Name: Design and Engineering

Max. Marks : 100

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. How to identify the customer requirements of design?
2. List any three constraints that can occur in design process of a lunch box.
3. Compare convergent and divergent thinking strategies.
4. Describe the importance of empathize phase in design thinking.
5. What is a mathematical model? State its significance.
6. Explain the role of Prototyping in evaluating a Design.
7. Compare Project-based learning with Problem-based learning.
8. Explain biomimicry in design with an example.
9. List the ethics to be followed in engineering design.
10. How is the cost of a particular design estimated?

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. Show the designing of length adjustable mop to clean ceiling fan going through the various stages of the design process. Use hand sketches to illustrate the processes. (14)

OR

12. Find the customer requirements for designing a new car showroom. Show how the design objectives were finalized considering the design constraints. (14)

MODULE II

13. Illustrate the design thinking process through designing a walking stick for elderly people. (14)

OR

14. Illustrate design thinking approach for designing a helmet. Describe each stage of the process and iterative procedure involved. Use hand sketches to support your arguments. (14)

MODULE III

15. Design an office chair and communicate your design using sketches with design detailing, material selection, scale drawings and dimensions. (14)

OR

16. Explain the general guidelines for technical communication. Describe each point with an example. (14)

MODULE IV

17. Show the design of a simple cot and then depict how the design changes when considering (i) aesthetics and (ii) ergonomics into consideration. Give hand sketches and explanations to justify the changes in designs. (14)

OR

18. Design waste bins to be kept at public places for waste collection. The bin should be theft-resistant and protect the contents of the bin from external weather conditions. Design the bins with ergonomic consideration for waste collection workers. Sketch the design using hand drawings. (14)

MODULE V

19. Examine the changes in the design of a foot wear. The constraints are (i) production methods, (ii) life span requirement, (iii) reliability issues and (iv) environmental factors. Use hand sketches and give proper rationalization for the changes in design. (14)

OR

20. Describe how to estimate the cost of a table in design stage? Show how economics will influence the engineering designs. (14)
