

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022**COMMON TO CS, EC, EE, RB
(2020 SCHEME)****Course Code : 20EST200****Course Name: Design and Engineering****Max. Marks : 100****Duration: 3 Hours***Only use hand sketches to support your arguments.***PART A***(Answer all questions. Each question carries 3 marks)*

1. List the steps involved in engineering design process.
2. Explain any three types of design constraints.
3. Summarize the role of brain-storming in design thinking.
4. Compare convergent and divergent thinking strategies.
5. List the various methods for conveying Engineering design
6. Differentiate between prototypes and models.
7. Compare Project-based and Problem -based learning in design.
8. With the help of an example, define bio-mimicry.
9. Write short note on Design rights.
10. Briefly explain the role of ethics in Engineering design.

PART B*(Answer one full question from each module, each question carries 14 marks)***MODULE I**

11. Illustrate the various stages in designing a headset suitable for mobile phones. (14)

OR

12. Identify the objectives, functions and constraints for designing an automatic head light in automobiles for smooth night drive. Give the various stages of the design process. (14)

MODULE II

13. Design a pediatric syrup bottle that can be easily used among children below 3 years for feeding medicine. Explain the various stages involved in design thinking. (14)

OR

14. During this Covid-19 pandemic situation, people have to wear a mask. Sketch the possible designs and then refine them to the best design for a face mask. Show how the divergent-convergent thinking helps in the process. (14)

MODULE III

15. Teachers experience health issues by inhaling chalk powder with conventional dust removers. Develop any alternate method that can solve this issue. Draw the detailed 2D drawings of the refined method with design detailing, scale drawings and dimensions. (14)

OR

16. Prepare a technical report for a newly designed Bus Location Tracking mobile application developed for public transportation purpose with neat diagrams for presenting in a client meeting. (14)

MODULE IV

17. (a) Apply value engineering concepts to solve plastic pollution in our society. (10)
(b) Identify the significance of reverse engineering with an example (4)

OR

18. Explain modular approach in design engineering. How does it help in bringing efficient designs? Give a use case to support your statements. (14)

MODULE V

19. Examine the changes in the design of a raincoat with constraints of
i. Manufacturing methods
ii. Life span requirement
iii. Reliability issues and
iv. Environmental factors. (14)

Use hand sketches for the design.

OR

20. Describe various cost estimation techniques. Explain the significance of cost estimation. Explain how to estimate the cost of an automatic sanitizer dispenser system. Draw the sanitizer dispenser system and label its parts. (14)
