

B

407B1

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Register No:

Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION(R,S), MAY 2024

M. Tech. Machine Design

(2021 SCHEME)

Course Code : 21MD202
Course Name : Design Engineering
Max. Marks : 60

Duration:3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. Explain the importance of designing to codes and standards.
2. Explain what is involved in classifying differing views of customer requirements.
3. Discuss the importance of mathematical modeling in design.
4. Outline the considerations in design for brittle fracture.
5. Outline the fatigue design criteria often used in design.
6. Explain the need for Design of Forgings.
7. Describe polydyne cams.
8. Explain failure rate in reliability studies.

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Describe the various stages of development of a product. 6

OR

10. Discuss the considerations of a good design. 6

MODULE II

11. Discuss parametric design with an example. 6

OR

12. Explain in detail the means of communicating design and manufacturing information. 6

MODULE III

13. Distinguish between design for creep approach and design for fatigue failure approach. 6

OR

14. Explain in detail the factors affecting the selection of materials for engineering purposes. 6

MODULE IV

15. Discuss the Design for Assembly (DFA) guidelines for good design practice. 6

OR

16. Explain in detail 'Design of Welding'. 6

MODULE V

17. A hollow shaft of 0.6 m outside diameter and 0.4 m inside diameter is used to drive a propeller of a marine vessel. Shaft is mounted on bearings 5 m apart and it transmits 6000 kW at 1500 rpm. Modulus of rigidity of the shaft is 80GPa. Determine 6
(i) maximum shear stress developed in the shaft
(ii) angular twist between the bearings

OR

18. Discuss the load-deflection characteristics of a Belleville spring based on the parameter ratios. 6

MODULE VI

19. Explain the ergonomic and aesthetic design considerations for an operation theatre. 6

OR

20. Discuss failure data analysis for reliability. 6
