

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022**MACHINE DESIGN****(2021 Scheme)****Course Code: 21MD202****Course Name: Design Engineering****Max. Marks: 60****Duration: 3 Hours***Use of approved design data handbooks are permitted***PART A***(Answer all questions. Each question carries 3 marks)*

1. State the importance of design.
2. List out the steps in conceptual design.
3. Describe the different stages of creep.
4. Describe the factors influence the selection of manufacturing process.
5. What do you mean by polydyne cams?
6. Discuss about Belleville springs and its applications.
7. Describe about reliability.
8. List out the defects and failure modes.

PART B*(Answer one full question from each module, each question carries 6 marks)***Module 1**

9. Discuss the considerations of a good design. (6)

OR

10. Describe about redesign and design review. (6)

Module 2

11. Examine in detail about embodiment design. (6)

OR

12. Explain about detail design. (6)

Module 3

13. Explain about ductile fracture with a neat sketch. (6)

OR

14. Examine in detail about fatigue failure. (6)

Module 4

15. Demonstrate the design guidelines for manufacturing. (6)

OR

16. Demonstrate the design guidelines for casting. (6)

Module 5

17. It is required to transmit a power of 5kW at 750rpm. The angular deflection of the steel spindle transmitting the power should not exceed more than 0.35° per meter length. The modulus of rigidity for the spindle material is 84Gpa. Determine the diameter of the spindle and the shear stress induced in it. (6)

OR

18. Compare the strength and stiffness of a hollow shaft of the same external diameter as that of solid shaft. The inside diameter of the hollow shaft being half the external diameter. Both the shafts have the same material and length. (6)

Module 6

19. Demonstrate different hazard models with neat diagrams. (6)

OR

20. Examine aesthetic and ergonomic considerations in design. (6)
