Question Paper

Exam Date & Time: 05-Jul-2022 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES IV SEMESTER B.Sc. (Applied Sciences) in Engg. END SEMESTER THEORY EXAMINATION - MAY/ JUNE 2022

DESIGN OF MACHINE ELEMENTS [IME 242]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data may be suitably assumed Design data handbook is permitted

1)	Define the following: fatigue, creep, resilience, hardness	(2)
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A)

2)

- B) A mild steel shaft is subjected to bending moment of 1945 N-m and torque ⁽³⁾ of 1875 N-m. Find shaft diameter if yield strength of the material is 220 MPa using maximum shear stress theory. Take FOS=2.
- C) A load F on a simply supported shaft as shown in figure Fig.Q1C is 4000 N. ⁽⁵⁾ Find the fillet radius at the left if maximum stress at the left fillet is same as that of right fillet.





A) transmission shaft carries a gear mid-way between two bearings. The
A) bending moment due to gear varies in the range of -300 N-m to 500 N-m.
Torque varies from -100 N-m to 200 N-m. Material of the shaft is C30 with endurance limit 0.5 times the UTS. Assume size factor 0.85 and surface finish factor as 0.88. Assume Factor of safety as 2 in Soderberg equation