



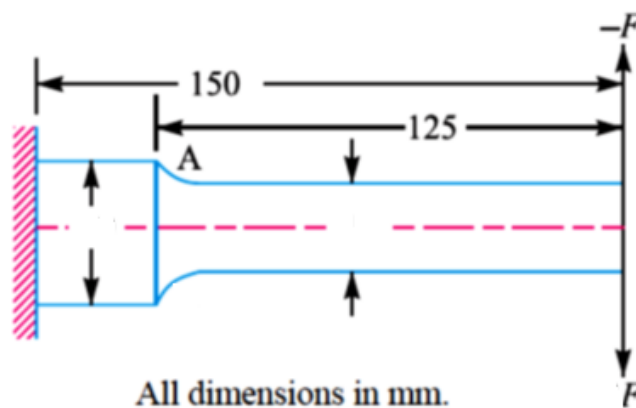
AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING

Quiz N :1

Course Code and Title:	Machine design II		
Semester and Year:	Fall 2020		
Examination Date:	11/10/2020	Maximum Time:	40 mn

A cantilever beam made of cold drawn carbon steel of circular cross-section as shown in the figure, is subjected to a load which varies from $-F$ to $+F$. The location at point A is a shoulder fillet sharp required for bearing.

Select the appropriate diameters for each section of the cantilever beam using DE-Goodman criterion and minimum factor of safety 2 (detail all steps and argued all your design decisions)



Assume the following values :

- $F = 100 \text{ N}$
- Ultimate stress = 550 MPa
- Yield stress = 470 MPa
- Size factor = 0.85
- Surface finish factor = 0.89
- The notch sensitivity is 0.9