Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.
(Autonomous)
B.E/B.Tech- Internal Assessment -III
Academic Year 2023-2024 (Even Semester)
Fourth Semester
Aerospace Engineering
19AST203– Aircraft Structural Mechanics

A

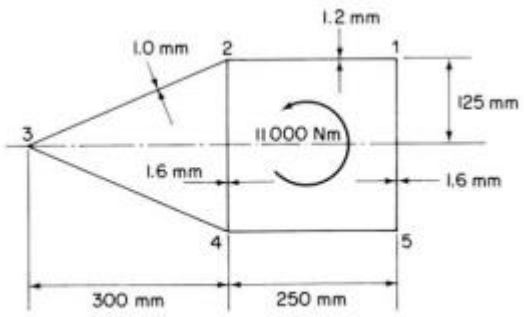
Time: 1 1/2 Hours **Maximum Marks: 50**

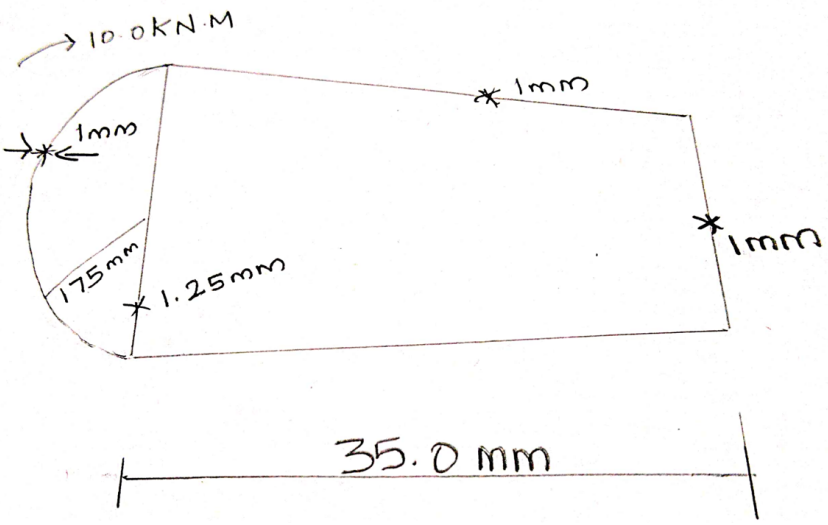
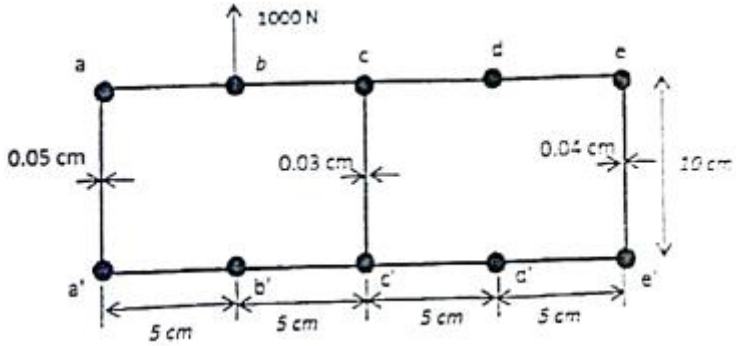
Answer All Questions

PART - A (5x 2 = 10 Marks)

		CO	Blooms
1	What is shear flow, and how is it related to thin-walled beams?	CO4	Rem
2	How is the shear center of a thin-walled beam determined?	CO4	App
3	Describe the Bredt-Batho theory and its application in determining shear flow distribution.	CO4	Rem
4	What is the local buckling stress of thin-walled sections, and why is it important?	CO5	App
5	Describe inter-rivet buckling and sheet wrinkling failures in sheet metal	CO5	App

PART – B (13+13+14=40 Marks)

				CO	Blooms
6	(a)	A thin-walled two-cell beam with the singly symmetrical cross-section shown in Fig. Is built-in at one end where the torque is 11000 Nm. Assuming the cross-section remains undistorted by the loading, determine the distribution of shear flow and the position of the centre of twist at the built-in end. The shear modulus G is the same for all walls.  	13	CO4	App
		(or)			

	(b)	Find the shear flow distribution and angle per twist in given fig. 	13	CO4	App
7.	(a)	Explain the pure tension field and semi tension field beam analysis and bring out their differences.	13	CO5	Eva
		(or)			
	(b)	What are the types of loads that an aircraft is subject to classify and explain these loads? Sketch and indicate how these loads act on an aircraft.	13	CO5	App
8.	(a)	Find the shear flow distribution for the cross section shown in Figure. Given area of stringers a = a' = 2 cm²; b = b' = d = d' = 0.5 cm2 ; c = c' = e = e' = 1 cm² and the thickness of ab=be=cd=de=a'b'=b'c'=c'd'=d'e' = 3 mm. 	14	CO4	Cre
		(or)			
	(b)	List out the different structural elements contained in an aircraft semi-monologue wing. What are their functions? Draw the wing diagram neatly.	14	CO5	Cre
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Abbreviations

Rem- Remember App-Apply Ana-Analyze Eva-Evaluate Cre-Create