PRN:		Course Code :	PAS103

006463

First Year **M. Tech** End Semester Examination Winter 2024

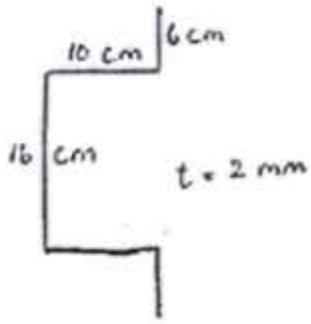
Aerospace Structure

Day and Date: Fri 06 DEC 2024 Max Marks: **100**

Time : 10:30AM To 01:30PM Duration: **03** hrs

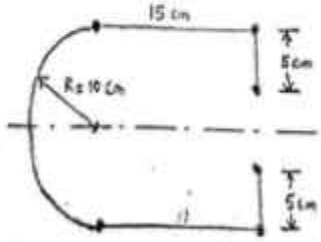
Instructions: All questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	Describe in detail about the different types of loads acting on the aircraft.	08	2	1
b)	Explain structural failure of an aircraft with the help of V-n diagram.	08	2	1
	OR			
b)	Describe load distribution over the aircraft wing and fuselage.	08	3	1
Q.2	**Attempt the following**			
a)	Drive the equation for open section shear flow.	08	2	1
b)	Locate the shear center of the given section vertical load is 12 KN acting vertically upward.	08	3	2



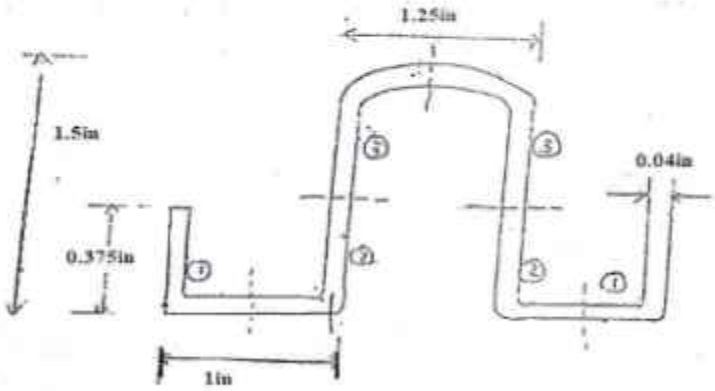
OR

b)	Find the shear flow and shear center to the open tube shown in fig for a vertical load of 10 KN acting through the shear center. stringers area =2cm^2	08	3	2



Backlog

Q.3	**Attempt any two from the following**			
a)	Drive the equation of buckling of thin plates subjected to pure bending.	08	1	2
b)	Briefly explain about Needhams and Gerands method to find the crippling strength of the thin wall section.	08	3	3
c)	Determine the crippling stress for the formed section, if the material is Al Alloy 2024-T3 $Fcy = 40{,}000Psi$, $Ec = 10700000Psi$,$Area = 0.255inch^2$.	08	3	3



Q.4	**Attempt any two from the following**			
a)	Derive and obtain an expression for the bending stress in an unsymmetrical section subjected to bending using Generalized K method.	08	3	3
b)	A Z- section with $12cm \times 3cm$ flanges and $20cm \times 3cm$ web (vertical) is subjected to $Mx = 10\ kNm$. Determine the bending stress at any one point . by using generalized method.	08	3	4
c)	An I section with flange 30 cm, web 50cm and thickness 2 cm is subjected to moment $Mx = 10\ kNm$. Find the tensile and compressive stresses at any two points. By using principal axis method.	08	2	4
Q.5	**Attempt any Two of the following**			
a)	Give nomenclature of aluminum alloy and explain the series.	09	3	4
b)	Explain about corrosion and alclad aluminum alloy.	09	2	4
c)	Write short notes on i. Extrusion ii. Forging iii. Spot-welding	09	3	5
Q.6	**Attempt any Two of the following**			
a)	Give physical properties of magnesium alloy	09	2	5
b)	Explain In detail about hydrogen embrittlement.	09	3	5
c)	Write short note on Casting and machining.	09	3	5

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