PRN:		Course Code :	AER3601

Third Year **B. Tech** End Semester Examination Winter 2024

Aircraft Structures II

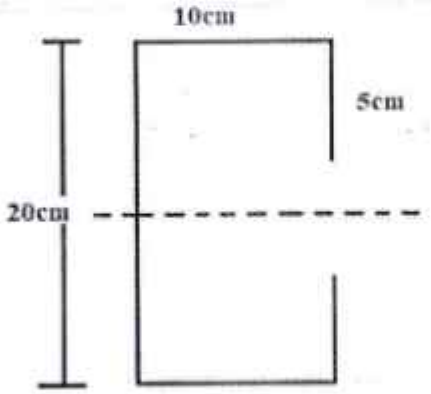
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Day and Date: Sat 30 NOV 2024 Max Marks: **50**

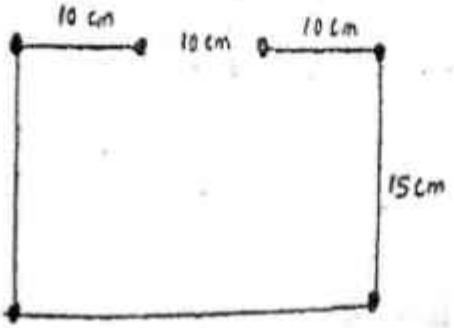
Time : 02:00PM To 04:00PM Duration: **02** hrs

Instructions: All questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**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 method.	06	1	1
b)	Derive and obtain an expression for the bending stress in an unsymmetrical section subjected to bending using Principal axis method.	06	3	1
c)	An T section with flange 30 cm, web 50cm and thickness 2 cm is subjected to moment $Mx = 5kNm$. Find the tensile and compressive stresses at any two points. By using principal axis method.	06	1	1
Q.2	**Attempt any two from the following**			
a)	Drive the equation for open section shear flow.	06	2	2
b)	Locate the shear center of the given section vertical load is 30 KN acting vertically downward. Thickness is 5mm	06	1	2



c)	The section shown in fig is subjected to a vertical load of $50kN$ through the shear center acting in upward direction. Obtain the shear flow of the section stringers $area = 5cm^2$	06	2	2

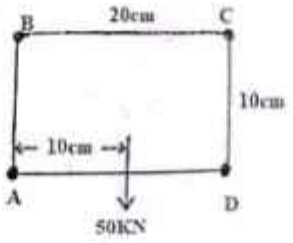


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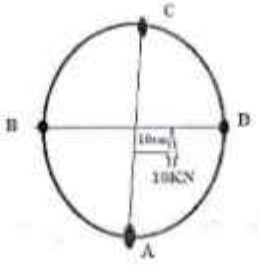
Q.3 Attempt the following

a) Determine the shear flow and shear center for the section shown in fig 06 2 3

$A=B=1cm^2$ $C=D=4cm^2$

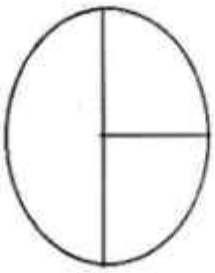


b) A fuselage Bulkhead of 2m radius has 4 stringers equally spaced around the section from top point each stringer area is $4\,cm^2$ the bulkhead is subjected to a shear centre and vertical shear load of $10KN$ act at $10cm$ from center point. Find the shear flow around the bulkhead. 07 3 3



or

b) A thin tubular bar shown in fig is subjected to a Torque of $T = 4000Ncm$ the dimensions are as indicated. Determine the shear stress on the walls, the radius of the circle is $10cm$. Thickness of all walls 2mm. 07 3 3



Q.4 Attempt the following

a) Briefly explain about Needhams and Gerands method to find the crippling strength of the thin wall section. 06 1 4

b) Drive the equation of buckling of thin plates subjected to pure bending. 07 3 4

or

b) Determine a crippling load of a $10cm\ x\ 10cm\ x2mm$ angle section column having an effective length $3m$ material used is steel $E= 200GPa$, $Fcy = 50000$. 07 3 4

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