Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/00

Year and Program: TY-B.Tech	**School of Technology**	**Department: AERO**
Course Code: AET303	**Course Title: Aircraft Structures-I**	**Semester : 05**
Day : **Date:**	**End Semester Examination**	**Time:2 Hrs.** **Max Marks:50**

Question Paper

Instructions: 1) All Questions are compulsory.
2) Assume data wherever necessary

		Marks	Bloom's Level	CO
Q.1	**Answer the following (any Two)**–			
a)	Cantilever beam length of 2.6 m supports with concentrate load of 5kN at free end. Calculate deflections at that point. Take E=200Gpa & I=20.1* $10^6 mm^4$.	8	2	CO1
b)	Derive load intensity, shear force and bending moment relationships for beam.	8	2	CO1
c)	Derive moment of area I_{xx} for beam of circular diameter.	8	2	CO2
Q.2	**Answer the following (any two)** –			
a)	Explain in detail the concept of shear flow for symmetrical and/or unsymmetrical beam.	8	3	CO3
b)	Determine warping distribution w_{01} in the rectangular closed section beam when subjected to torque T as shown in figure 1. Assume G is constant and $w_0 = 0$. The length of beam is a and width of the beam is b.	8	3	CO3

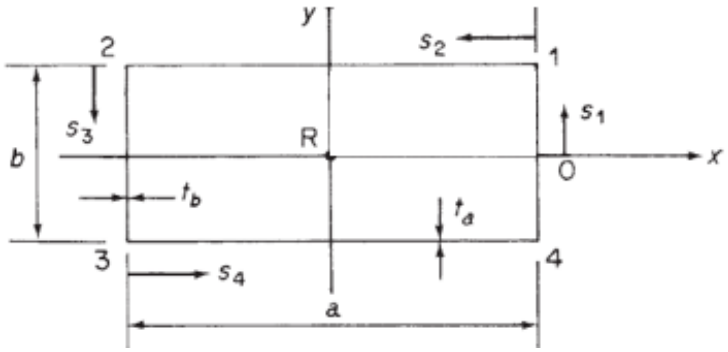


Fig. 1

c) Explain the following terms. 8 2 CO3
1) Shear flow 2) CSRD 3) Shear center 4) Shear Force

Q.3 Answer the following (any two) –

a) Determine the shear flow distribution q_{12}, q_{23} in the beam section shown in figure 2 when it is subjected to a shear load of 100kN in its vertical plane of symmetry. The thickness of the walls of the section is 2mm throughout.Consider $I_{xx} = 14.5 \times 10^6$ mm^4. 9 3 CO4

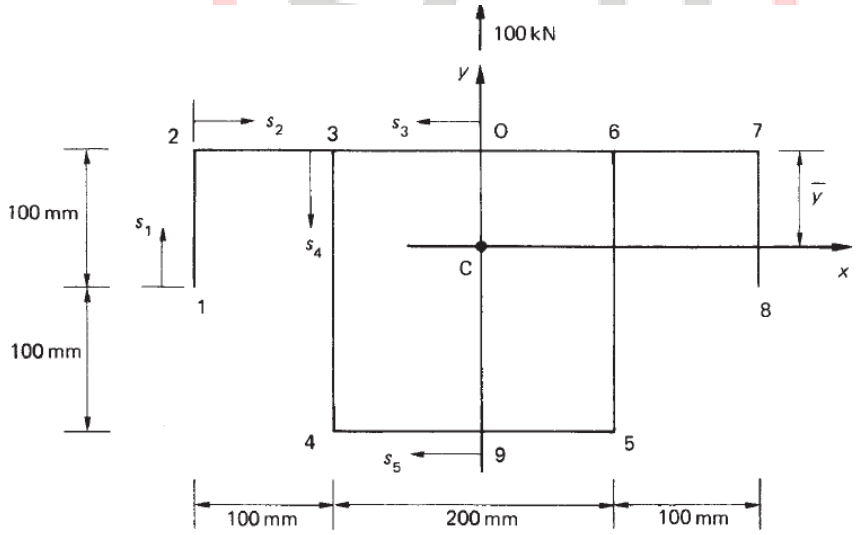


Fig. 2

b) Calculate the angle of twist per unit length and maximum shear stress in the wing whose cross-section is shown in figure 3 when subjected to torque of 55kNm. Consider G = 25000 N/mm^2, wall outer (12) = 900 mm and nose cell area = 20000 mm^2. 9 3 CO4

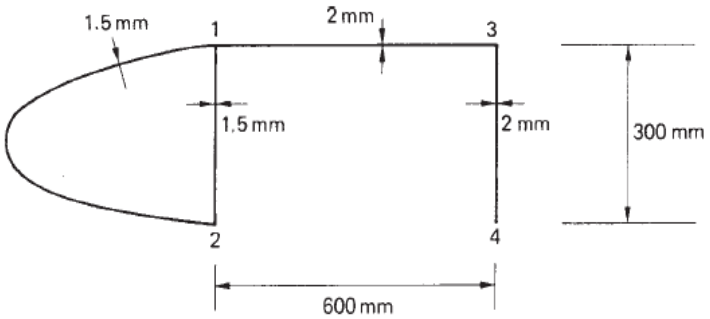


Fig. 3

c) With the help of a neat sketch explain the idealization of a panel. 9 3 CO5

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