Code No: RR322102 **RR** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
AIRCRAFT STRUCTURES - II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. "Z" stiffener shown in Figure 1 is one of the several stiffeners riveted to skins of thickness 0.8mm and of same material as the stiffener. If the length of the panel is 500mm what will be the column failing stress if end fixity c=1.5. Use method involving sheet effective widths.(All dimensions are in mm). [16]

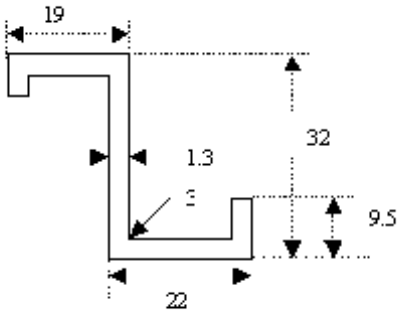

Figure 1

2.

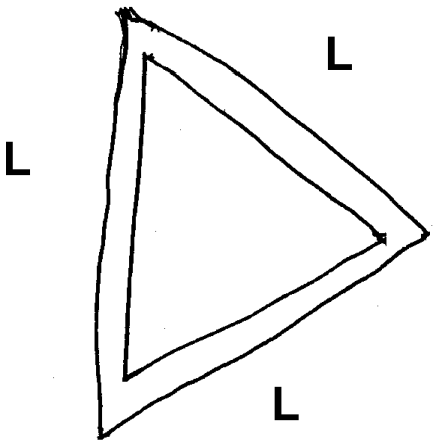

Figure 2

A thin walled Box beam is use in the support structure of an aeroplane wing. Locate its shear centre. Shown in figure 2. [16]

3. Define shear flow? Explain the concept of shear flow in thin walled beams with the help of a neat sketch. [16]

4.

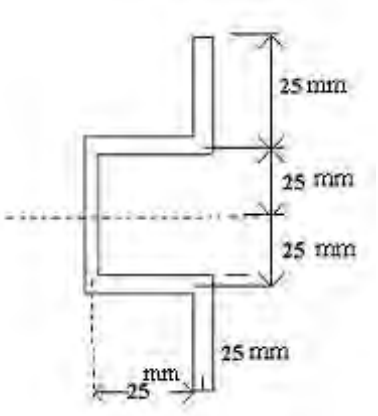

Figure 4

Determine the shear centre of hat-type thin walled section. Shown in figure 4. The thickness t is constant through out the beam. [16]

5. Explain shear flow due to torsion

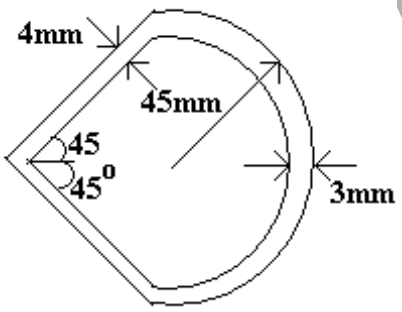

Figure 5

The Allowable Sear Stress in the torsion member is 60mpa. Determine the Design torque and angle of twist if it is having span of 3m. It is made of steel G=76 GPa. Also calculate the strain energy stored. Shown in figure 5. [16]

6. What are the considerations in the flange design of a beam composed of flange members riveted or spot-welded to a web member. [16]

7. Using the general equation for elastic bending stress find the stresses at points B and F for the angle section shown in figure 7. The applied moment is $M_z = 10$ kNm

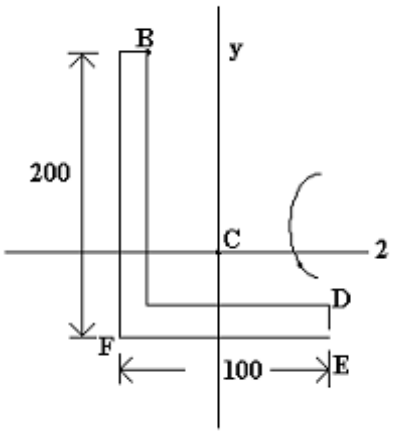

Figure 7

The section properties are:
$\overline{y} = 74.3mm$
$\overline{z} = 24.3 from\, F$
$I_z = 22.64x10^6 mm^4$
$I_y = 3.84x10^6 mm^4$
$I_{xy} = 5.14x10^6$
Locate the orientation of the neutral axis. [16]

8. Write short notes on the following:
   (a) Aerodynamic loads
   (b) Ground loads. [8+8]

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Code No: RR322102 **RR** **Set No. 4**

III B.Tech II Semester Examinations,December 2010
AIRCRAFT STRUCTURES - II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the considerations in the flange design of a beam composed of flange members riveted or spot-welded to a web member. [16]

2. Using the general equation for elastic bending stress find the stresses at points B and F for the angle section shown in figure 2. The applied moment is $M_z = 10$ kNm

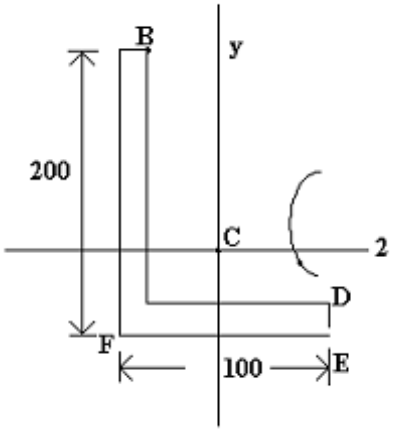

Figure 2

The section properties are:
$\overline{y} = 74.3mm$
$\overline{z} = 24.3 from\, F$
$I_z = 22.64x10^6 mm^4$
$I_y = 3.84x10^6 mm^4$
$I_{xy} = 5.14x10^6$
Locate the orientation of the neutral axis. [16]

3. Explain shear flow due to torsion

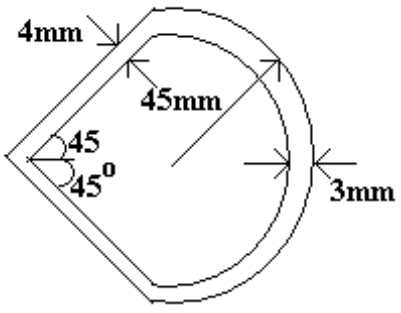

Figure 3

The Allowable Sear Stress in the torsion member is 60mpa. Determine the Design

torque and angle of twist if it is having span of 3m. It is made of steel G=76 GPa. Also calculate the strain energy stored. Shown in figure 3. [16]

4. "Z" stiffener shown in Figure 4 is one of the several stiffeners riveted to skins of thickness 0.8mm and of same material as the stiffener. If the length of the panel is 500mm what will be the column failing stress if end fixity c=1.5. Use method involving sheet effective widths.(All dimensions are in mm). [16]

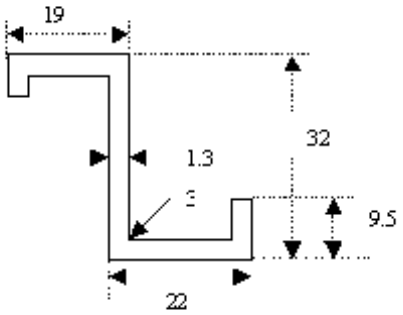

Figure 4

5.

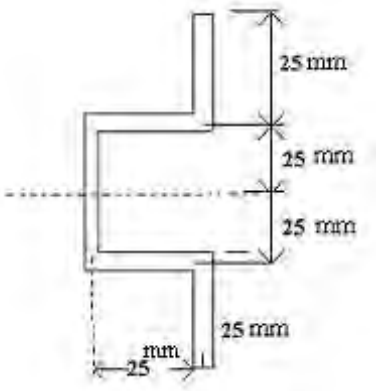

Figure 5

Determine the shear centre of hat-type thin walled section. Shown in figure 5. The thickness t is constant through out the beam. [16]

6. Write short notes on the following:

   (a) Aerodynamic loads

   (b) Ground loads. [8+8]

7.

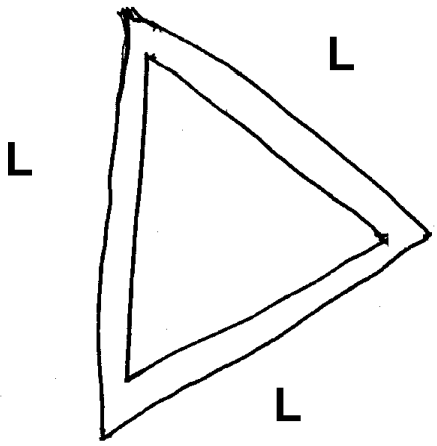

Figure 7

A thin walled Box beam is use in the support structure of an aeroplane wing. Locate its shear centre. Shown in figure 7. [16]

8. Define shear flow? Explain the concept of shear flow in thin walled beams with the help of a neat sketch. [16]

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Code No: RR322102 **RR** **Set No. 1**

III B.Tech II Semester Examinations,December 2010
AIRCRAFT STRUCTURES - II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1.

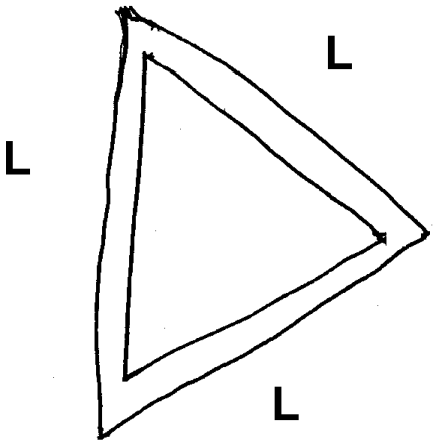

Figure 1

A thin walled Box beam is use in the support structure of an aeroplane wing. Locate its shear centre. Shown in figure 1. [16]

2. Write short notes on the following:
   (a) Aerodynamic loads
   (b) Ground loads. [8+8]

3. Using the general equation for elastic bending stress find the stresses at points B and F for the angle section shown in figure 3. The applied moment is $M_z = 10$ kNm

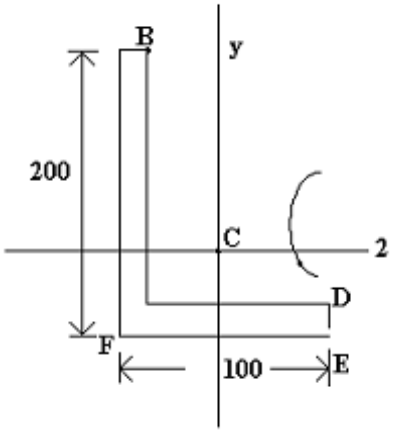

Figure 3

The section properties are:
$\overline{y} = 74.3mm$

$\overline{z} = 24.3 from\, F$
$I_z = 22.64x10^6 mm^4$
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Locate the orientation of the neutral axis. [16]

4. What are the considerations in the flange design of a beam composed of flange members riveted or spot-welded to a web member. [16]

5.

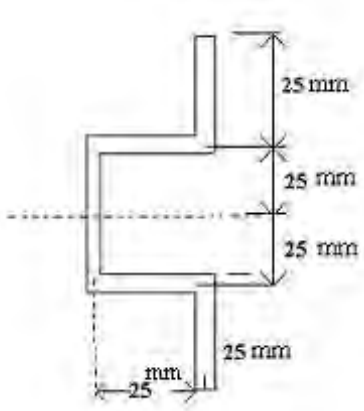

Figure 5

Determine the shear centre of hat-type thin walled section. Shown in figure 5. The thickness t is constant through out the beam. [16]

6. Explain shear flow due to torsion

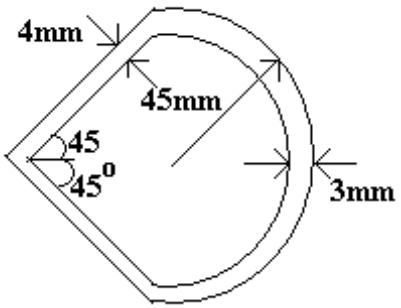

Figure 6

The Allowable Sear Stress in the torsion member is 60mpa. Determine the Design torque and angle of twist if it is having span of 3m. It is made of steel G=76 GPa. Also calculate the strain energy stored. Shown in figure 6. [16]

7. "Z" stiffener shown in Figure 7 is one of the several stiffeners riveted to skins of thickness 0.8mm and of same material as the stiffener. If the length of the panel is 500mm what will be the column failing stress if end fixity c=1.5. Use method involving sheet effective widths.(All dimensions are in mm). [16]

Code No: RR322102 **RR** **Set No. 1**

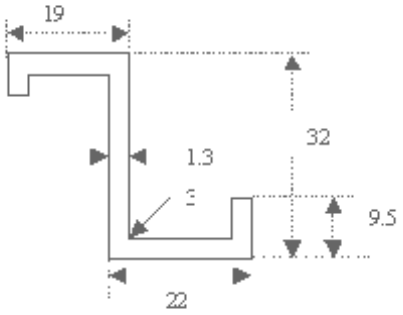

Figure 7

8. Define shear flow? Explain the concept of shear flow in thin walled beams with the help of a neat sketch. [16]

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Code No: RR322102 **RR** **Set No. 3**

III B.Tech II Semester Examinations,December 2010
AIRCRAFT STRUCTURES - II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Using the general equation for elastic bending stress find the stresses at points B and F for the angle section shown in figure 1 . The applied moment is $M_z = 10$ kNm

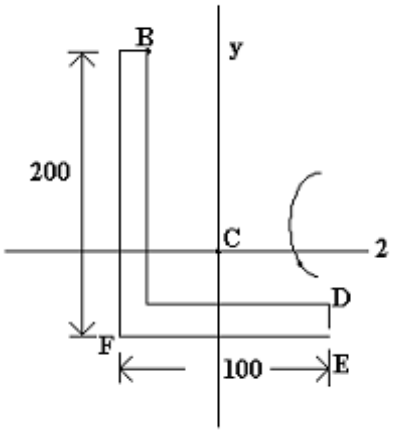

Figure 1

The section properties are:
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$\overline{z} = 24.3 from\ F$
$I_z = 22.64x10^6 mm^4$
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Locate the orientation of the neutral axis. [16]

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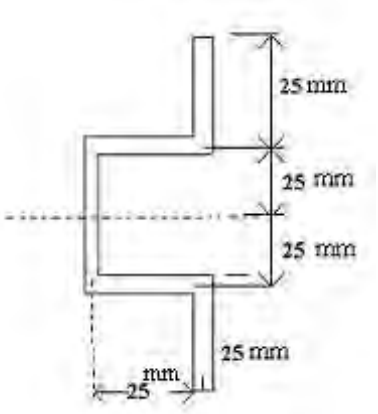

Figure 4

Determine the shear centre of hat-type thin walled section. Shown in figure 4. The thickness t is constant through out the beam. [16]

5. Define shear flow? Explain the concept of shear flow in thin walled beams with the help of a neat sketch. [16]

6. Explain shear flow due to torsion

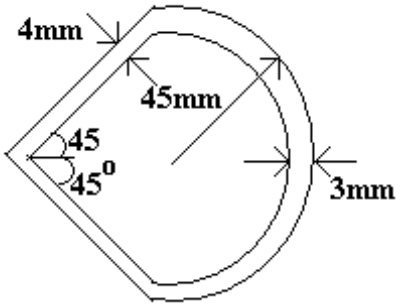

Figure 6

The Allowable Sear Stress in the torsion member is 60mpa. Determine the Design torque and angle of twist if it is having span of 3m. It is made of steel G=76 GPa. Also calculate the strain energy stored. Shown in figure 6. [16]

7. "Z" stiffener shown in Figure 7 is one of the several stiffeners riveted to skins of thickness 0.8mm and of same material as the stiffener. If the length of the panel is 500mm what will be the column failing stress if end fixity c=1.5. Use method involving sheet effective widths.(All dimensions are in mm). [16]

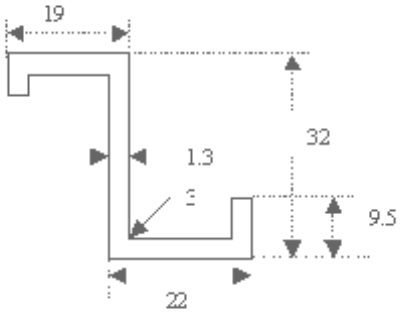

Figure 7

8.

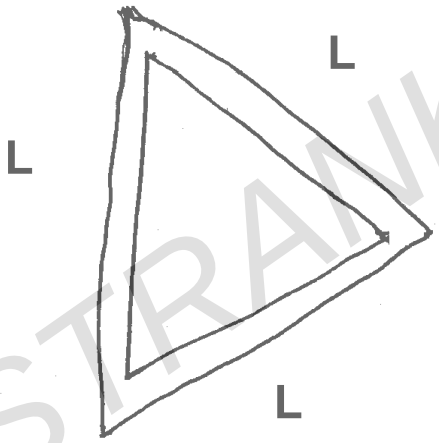

Figure 8

A thin walled Box beam is use in the support structure of an aeroplane wing. Locate its shear centre. Shown in figure 8. [16]

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