Code No: 07A42101 **R07** **Set No. 2**

II B.Tech II Semester Examinations,APRIL 2011
AERODYNAMICS - I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. State and apply Biot-Savart law to find velocity induced at a point by an infinite straight vortex filament. [16]

2. (a) Explain the following
      i. lifting-surface concept
      ii. Panel solutions
   (b) Explain about the vortex lattice system on a finite wing. [8+8]

3. (a) An airfoil is kept at 12 degrees angle of attack in a flow. The lift and drag coefficients are 3.0 and 0.2 respectively. Find the normal and axial forces.
   (b) The normal force is acting at the mid point of the chord. Find the moment on the airfoil at the leading edge of the airfoil. [8+8]

4. (a) Derive the moment coefficient about the leading edge for a cambered airfoil.
   (b) Derive the expression for the distance of the centre of pressure from the leading edge of a cambered airfoil. [12+4]

5. Explain with neat sketch various types of source panel methods. [16]

6. Write short notes on:
   (a) Bernoulli's equation
   (b) Similarity parameters. [8+8]

7. (a) Describe in brief the merits of 'Lifting Surface Theory' for predicting lift dis tribution on a wing with an arbitrary platform. Make use of sketches and other representations in this regard.
   (b) Compare the formulation in (a) above with that in the classical lifting line theory with details. [8+8]

8. With the aid of Kutta - Zukovsky transformation explain how a circle can be transformed into a cambered airfoil. [16]

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Code No: 07A42101 **R07** **Set No. 4**

II B.Tech II Semester Examinations,APRIL 2011
AERODYNAMICS - I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. With the aid of Kutta - Zukovsky transformation explain how a circle can be transformed into a cambered airfoil. [16]

2. Explain with neat sketch various types of source panel methods. [16]

3. (a) Derive the moment coefficient about the leading edge for a cambered airfoil.
   (b) Derive the expression for the distance of the centre of pressure from the leading edge of a cambered airfoil. [12+4]

4. Write short notes on:
   (a) Bernoulli's equation
   (b) Similarity parameters. [8+8]

5. (a) An airfoil is kept at 12 degrees angle of attack in a flow. The lift and drag coefficients are 3.0 and 0.2 respectively. Find the normal and axial forces.
   (b) The normal force is acting at the mid point of the chord. Find the moment on the airfoil at the leading edge of the airfoil. [8+8]

6. State and apply Biot-Savart law to find velocity induced at a point by an infinite straight vortex filament. [16]

7. (a) Describe in brief the merits of 'Lifting Surface Theory' for predicting lift dis tribution on a wing with an arbitrary platform. Make use of sketches and other representations in this regard.
   (b) Compare the formulation in (a) above with that in the classical lifting line theory with details. [8+8]

8. (a) Explain the following
      i. lifting-surface concept
      ii. Panel solutions
   (b) Explain about the vortex lattice system on a finite wing. [8+8]

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Code No: 07A42101 **R07** **Set No. 1**

II B.Tech II Semester Examinations,APRIL 2011
AERODYNAMICS - I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. State and apply Biot-Savart law to find velocity induced at a point by an infinite straight vortex filament. [16]

2. Explain with neat sketch various types of source panel methods. [16]

3. (a) An airfoil is kept at 12 degrees angle of attack in a flow. The lift and drag coefficients are 3.0 and 0.2 respectively. Find the normal and axial forces.
   (b) The normal force is acting at the mid point of the chord. Find the moment on the airfoil at the leading edge of the airfoil. [8+8]

4. (a) Derive the moment coefficient about the leading edge for a cambered airfoil.
   (b) Derive the expression for the distance of the centre of pressure from the leading edge of a cambered airfoil. [12+4]

5. (a) Describe in brief the merits of 'Lifting Surface Theory' for predicting lift dis tribution on a wing with an arbitrary platform. Make use of sketches and other representations in this regard.
   (b) Compare the formulation in (a) above with that in the classical lifting line theory with details. [8+8]

6. (a) Explain the following
      i. lifting-surface concept
      ii. Panel solutions
   (b) Explain about the vortex lattice system on a finite wing. [8+8]

7. Write short notes on:
   (a) Bernoulli's equation
   (b) Similarity parameters. [8+8]

8. With the aid of Kutta - Zukovsky transformation explain how a circle can be transformed into a cambered airfoil. [16]

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Code No: 07A42101 **R07** **Set No. 3**

II B.Tech II Semester Examinations,APRIL 2011
AERODYNAMICS - I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Derive the moment coefficient about the leading edge for a cambered airfoil.
   (b) Derive the expression for the distance of the centre of pressure from the leading edge of a cambered airfoil. [12+4]
2. (a) Describe in brief the merits of 'Lifting Surface Theory' for predicting lift dis tribution on a wing with an arbitrary platform. Make use of sketches and other representations in this regard.
   (b) Compare the formulation in (a) above with that in the classical lifting line theory with details. [8+8]
3. Write short notes on:
   (a) Bernoulli's equation
   (b) Similarity parameters. [8+8]
4. Explain with neat sketch various types of source panel methods. [16]
5. (a) Explain the following
      i. lifting-surface concept
      ii. Panel solutions
   (b) Explain about the vortex lattice system on a finite wing. [8+8]
6. (a) An airfoil is kept at 12 degrees angle of attack in a flow. The lift and drag coefficients are 3.0 and 0.2 respectively. Find the normal and axial forces.
   (b) The normal force is acting at the mid point of the chord. Find the moment on the airfoil at the leading edge of the airfoil. [8+8]
7. State and apply Biot-Savart law to find velocity induced at a point by an infinite straight vortex filament. [16]
8. With the aid of Kutta - Zukovsky transformation explain how a circle can be transformed into a cambered airfoil. [16]

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