

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018**

**Subject Code:2160101**

**Date:28/04/2018**

**Subject Name:Aerodynamics II**

**Time:10:30 AM to 01:00 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		<b>MARKS</b>
<b>Q.1</b>	(a) Difference between Subsonic flow and Supersonic flow.	<b>03</b>
	(b) Car cannot fly? Justify the statement	<b>04</b>
	(c) Explain Airfoil Nomenclature with a neat sketch	<b>07</b>
<b>Q.2</b>	(a) Define: - critical Mach number and super critical airfoil.	<b>03</b>
	(b) Define: - Induced angle of attack and Circulation.	<b>04</b>
	(c) State and Explain Kutta condition with the help of diagram. Also explain importance of Kutta condition	<b>07</b>
<b>OR</b>		
	(c) Explain steps for exact Joukowski transformation process and its numerical solution	<b>07</b>
<b>Q.3</b>	(a) Define Drag and Lift with equations.	<b>03</b>
	(b) What do you understand by Kelvin's theorem?	<b>04</b>
	(c) Explain low speed flow over an airfoil	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Difference between compressible flow and Incompressible flow.	<b>03</b>
	(b) Explain Horse shoe vortex.	<b>04</b>
	(c) Explain with diagram Supersonic flow over an airfoil.	<b>07</b>
<b>Q.4</b>	(a) Define :- Geometric Twist, Effective Angle of Attack	<b>03</b>
	(b) Explain bound vortex.	<b>04</b>
	(c) Explain in details with procedure about transformation of circle into symmetric airfoil	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Explain Delta wing.	<b>03</b>
	(b) Define mean camber line and chord line.	<b>04</b>
	(c) Explain Biot-Savart Law for vortex.	<b>07</b>
<b>Q.5</b>	(a) Explain Downwash.	<b>03</b>
	(b) What is supersonic area rule? Explain	<b>04</b>
	(c) Derive Linearized supersonic Lift coefficient formula.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Explain streamline and stream function	<b>03</b>
	(b) Explain angular velocity and vorticity.	<b>04</b>
	(c) Explain Classical thin airfoil theory for symmetric airfoil.	<b>07</b>

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