

## Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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### Fourth Semester B.E. Degree Examination AERODYNAMICS-I

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			*Bloom's Taxonomy Level	Marks
Q.01	a	With a relevant sketch, Derive an expression for control volume approach to energy equation	L2	15
	b	Derive an expression of speed of sound.	L2	5
OR				
Q.02	a	Write a note on angular velocity and circulation	L2	10
	b	Consider an airplane flying at velocity of 550m/s. Calculate the Mach number if flying with an altitude of sea level, 10km and 20km with a temperature of 288K, 255.5K 223.3K respectively.	L3	10
Module-2				
Q. 03	a	With a neat sketch, explain the Airfoil Nomenclature & its characteristics	L2	10
	b	With a neat sketch, explain the forces and moments of an Airfoil	L2	10
OR				
Q.04	a	Define drag and explain its types which acts on an Airfoil	L1	08
	b	With a neat sketch explain the lift & drag measurement by surface pressure distribution.	L2	12
Module-3				
Q. 05	a	With a neat sketch, derive an expression of velocity potential and stream function of uniform flow.	L2	08
	b	Briefly explain about source flow and sink flow	L1	04
	c	Briefly explain about Non-lifting flow over a circular cylinder	L3	08
OR				
Q. 06	a	With a neat sketch explain the Doublet flow and Vortex flow.	L2	10
	b	Explain airfoil theory for both symmetric and cambered airfoil	L2	10
Module-4				
Q. 07	a	With a neat sketch explain Biot-Savart law & Halmholz theorem	L2	10
	b	Explain vortex lattice method for a wing	L2	06
	c	Write a note on lift distribution on a wing	L2	04
OR				
Q. 08	a	Explain the Prandtl-classical lifting theory and its effects.	L2	10
	b	Write a note on Downwash and Induced drag	L2	10
Module-5				
Q. 09	a	With a relevant sketch explain the Horse-Shoe vortex method for airfoil/wing.	L2	10
	b	Write a note on Swept wing and its pressure co-efficient for wing	L2	06
	c	Briefly explain the lift and drag divergence on airfoil	L2	04
OR				
Q. 10	a	Explain about flaps and typical High-lift characteristics.	L1	10

	b	Explain about subsonic and supersonic leading edge effect	L2	10
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\*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.