PRN:		Course Code:	UAE503

Third Year **B. Tech** End Semester Examination Winter 2024

Aircraft Design

000103

Day and Date: Sat 23 Nov 2024 Max Marks: **100**

Time: 10:30AM To 01:30PM Duration: **03** hrs

Instructions: All questions are compulsory.

			Marks	Bloom's Level	CO
Q.1		**Attempt the following**			
	a)	State different types of civil and military aircraft. Explain any one civil or military aircraft in detail.	08	2	1
	b)	How do you classify airplanes? Explain each one of them with necessary diagrams.	08	2	1
		OR			
	b)	Discuss the difference between HTA and LTA in detail.	08	2	1
Q.2		**Attempt the following**			
	a)	Discuss in detail account of unconventional configuration of aircraft design.	08	2	2
	b)	Explain classification of airplanes based on its function and list down the factors affecting aircraft configuration.	08	2	2
		OR			
	b)	Write short notes on (i) Tailless and flying wing design and (ii) Canard Design.	08	2	2
Q.3		**Attempt any two from the following**			
	a)	Draw and explain the mission profile of an aircraft, and derive the weight estimation for an aircraft design.	08	3	3
	b)	Briefly explain the concept of rudder and engine sizing in aircraft design	08	2	3
	c)	What is constraint analysis in aircraft design? Explain the key constraints involved in the design process.	08	2	3
Q.4		**Attempt any two from the following**			
	a)	What are the estimation methodologies for acquisition cost in aircraft design?	08	2	4
	b)	Describe in detail the components of direct operating cost (DOC) in aircraft design.	08	2	4

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	c)	Explain the estimation methodologies for component mass breakdown in aircraft design.	08	2	4
Q.5		**Attempt any Two of the following**			
	a)	Discuss special considerations such as stealth and survivability in aircraft design.	09	2	5
	b)	Draw and explain the range-payload diagram in aircraft design.	09	2	5
	c)	Discuss the V-N diagram in detail.	09	2	5
Q.6		**Attempt any Two of the following**			
	a)	Discuss the design methodologies for supersonic aircraft.	09	2	6
	b)	Explain in detail the concept of morphing aircraft.	09	3	6
	c)	Briefly describe advanced concepts in aircraft design.	09	2	6

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