GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII(OLD) • EXAMINATION – WINTER 2016

Subject Code: 170101Date: 29/1Subject Name: Aircraft Design - 1Total MarTime: 10:30 AM to 01:00 PMTotal Mar		Code: 170101 Date: 29/11/2016	Date: 29/11/2016 Total Marks: 70	
		Name: Aircraft Design - 1 0:30 AM to 01:00 PM Total Marks: 70		
Ins	struction 1. 2. 3.	ns: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a)	Explain design and development process of aircraft. Explain with block diagram.	07	
	(b)	Briefly explain three stages of Aircraft design.	07	
Q.2	(a)	Derive an equation to determine Maximum Take-Off Weight (WO) of Aircraft.	07	
	(b)	Draw a neat sketch explaining how to find MAC of main wing? Just draw a sketch which can show how will you match C.G with main wing plan view? OR	07	
	(b)	Explain method to design geometrical parameters of aircraft fuselage of public transport aircraft.	07	
Q.3	(a) (b)	Explain factors affecting weight of horizontal and vertical stabilizers. Explain principles of aerodynamic and mass balancing of primary control surfaces.	07 07	
Q.3	(a)	With neat sketch explain advantages and disadvantages of different tail plane configuration	07	
	(b)	How will you select wing plan form shape? Which factors affect wing plan form shape?	07	
Q.4	(a)	With vector diagrams and neat sketches explain cyclic and collective pitch control mechanism of main rotor.	07	
	(b)	Explain types of air inlets for subsonic and supersonic aircraft.	07	
Q.4	(a)	Describe techniques to improve stability and maneuverability in different types of fighter aircrafts.	07	
	(b)	If you are designing a supersonic ground attack aircraft, Enlist considerations you will take.	07	
Q.5	(a)	How will you choose airfoil section for your design? Discuss briefly.	07	
	(b)	Shortly define- Maximum Take-Off Weight, Maximum Cruising Speed, Stalling Speed, Maximum Ramp Weight, Maneuvering Speed, Approach Speed and Maximum Landing Weight. OR	07	
Q.5	(a)	What are general considerations to design configurations of gliders or sailplanes?	07	
	(b)	Differentiate between Turbofan engine and Turbo shaft engine with respect to performance and applications.	07	
