Sea	ii No	Enrolment No		
		GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2017		
Su	bjec	et Code: 2180101 Date: 29/04/20	Date: 29/04/2017	
Su	bjec	et Name: Aircraft Design II		
Tiı	me:	10:30 AM to 01:00 PM Total Marks:	70	
Inst	tructi			
		 Attempt all questions. Make suitable assumptions wherever necessary. 		
		3. Figures to the right indicate full marks.		
		1. Attempt Q-1 and 2 (A) in drawing sheet.		
Q-1	A	Draw an intermediate cross section of a nessele of 2D ramp inlet of circle to square adaptor joining a circular cross section of diameter of 12 cm and a material range section of 12 cm X 14 cm	07	
	В	rectangular cross section of 12 cm X 14 cm. Draw a side view of a vertical fin with structural details as per below mentioned data. Speed of aircraft is 0.82 Mach. Height= 20 feet, Root chord = 12 feet, Tip chord = 4 feet. Rib pitch= 1 feet. Note: Choose suitable sweep back angle.	07	
Q-2	A	Prepare wing layout of starboard cantilever wing. Planform shape is tapered. Wing span = 60 feet, root chort= 8 feet, tip chord is 5 feet. Draw ideal locations of spar, ribs and stringers. Rib pitch= 2 feet. Locate ailerons and flaps. Engines are not mounted on the wing.	07	
	В	Discuss design of a multi-engine piston prop aircraft carrying paratrooping operations.	07	
	n	OR	07	
	В	How will you locate fuel tanks in jet transport aircrafts?	07	
Q-3	A	With neat sketches discuss sea planes design considerations.	07	
	В	Discuss various prop VTOL configurations with neat sketches.	07	
		OR	٥.	
	A	Discuss design of pressurize fuselage aircraft having seating capacity of 186 passengers. What will be approximate dimensions of fuselage? Draw cross section of passenger cabin with dimensions.	07	
	В	Suppose a four engine piston prop, high wing, military cargo aircraft has been converted into arial gunship. Then where will you locate turrets and bomb bays so that you can attach maximum numbers of guns without changing C.G.	07	
Q-4	A	With neat sketch explain locations of crew stations of a conventional bomber. Consider two pilots, gunners, Navigator, flight engineer, ground observer on board.	07	
	В	What will you do to improve producibility of aircraft components? OR	07	

- A Discuss contrarotor helicopter control system with neat sketch. 07
- **B** Discuss conic fuselage development with neat sketches of fuselage side views **07** and top views.
- Q-5 A With neat sketch explain which considerations should be taken to design 07 undercarriage retraction geometry.
 - **B** How will you select either hydraulic or pneumatic system for particular operation? With reason explain what type of actuator you will use for steering, primary control surfaces and air brakes.

OR

- A With neat sketches briefly explain aerodynamic consideration of a 2D ramp inlet. With neat sketch explain Capture area, Throat area, Retractable/ Adjustable ramp, Boundary layer separator, Boundary layer divertor and Boundary layer absorber.
- **B** How will you improve sustainability of a tandom seater deep penetration strike jet fighter cruising at 50-60 feet AGL? Consider locations of fuel tanks, weapons, guns, and cockpit and empennage design.
