Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code: 180101 **Date:07/12/2015**

Subject Name: Aircraft Design-II

Time: 2:30pm to 5:00pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Draw a conic lofting curve of a fuselage cross section as per below mentioned data. Quadrant=4th (Upper left), Fuselage cross section Height= Width=40 cm. $\rho = 0.7$.	**07**
	(b)	Draw a layout of a wing of a multirole supersonic jet fighter as per below mention data. C_r= 16 feet, λ =0.25 wing span b= 32 feet, M_{max}=2.2, $\wedge_{LE}$= 45˚. Show integrated primary control surfaces on wings. Mention C.G. margin. Mention technics to keep flow chord wise. Note that wing tip is to be used for missile hard point.	**07**
Q.2	**(a)**	Draw a layout of a Supersonic stabilators as per given data. C_r = 10 feet. λ= 0.4, Span= 16 feet, $\wedge_{LE}$ = 45˚, Jet Blast Angle = 21˚ (Just after hinge axis), M_{max}=2.2. Hinge axis is perpendicular to longitudinal axis. Modify tip such a way that tip can be free from tip shock cone.	**07**
	(b)	Explain technics to improve Producibility of jet fighter aircrafts.	**07**
		OR	
	(b)	Explain how you will improve battle damage sustainability of jet fighter aircrafts.	**07**
Q.3	**(a)**	With neat sketch explain hull geometry of a seaplane.	**07**
	(b)	Discuss various technics to hide a jet fighter from various types of Radars.	**07**
		OR	
Q.3	**(a)**	Explain how Thrust Specific Fuel Consumption (T.S.F.C.) affects performance parameters of a jet fighter aircrafts.	**07**
	(b)	With neat sketch explain wing lofting technic of a taper or delta wing layout.	**07**
Q.4	**(a)**	Discuss conventional helicopter control system with neat sketch.	**07**
	(b)	Explain 2-D ramp inlet geometry subject to different Mach numbers. Explain with neat sketch.	**07**
		OR	
Q.4	**(a)**	Define various weights to be considered as per a given flight envelope.	**07**
	(b)	Classify various inlets with subject to Mach number.	**07**
Q.5	**(a)**	With neat sketches explain technics to locate weapons and gun installations.	**07**
	(b)	Explain how you will locate main wheels in a jet trainer aircraft of naval version.	**07**
		OR	
Q.5	**(a)**	Explain engine selection technic for jet aircraft with necessary graph.	**07**
	(b)	Classify jet VTOL technic. Explain any one of them with neat sketch.	**07**

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