Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2140103 **Date: 08/06/2017**

Subject Name: Aircraft Systems, Instruments and Maintenance

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw each and every figure by instruments only. Freehand sketches are strictly not allowed.**

			MARKS
Q.1		**Short Questions**	**14**
	1	What will happen with altimeter reading if pitot is blocked during climb?	
	2	What happens with mach meter reading of a cruising aircraft if temperature increases?	
	3	What happens with air speed indicator reading of climbing aircraft with constant True Air Speed (TAS) if pitot is blocked?	
	4	Which two gyro instruments work on the principle of "Rigidity in Space"?	
	5	Which two gyro instruments work on the principle of "Precession"?	
	6	What is the function of turbine in Aviation Gas Turbine Engine?	
	7	Define Bypass Ratio.	
	8	What is thrust vectoring?	
	9	Enlist thrust augmentation systems.	
	10	What is the function of accumulator in hydraulic system?	
	11	Define bleed air.	
	12	Define Mean Effective Pressure?	
	13	Define engine pressure ratio.	
	14	Enlist aircraft piston engine instruments.	
Q.2	**(a)**	Shortly explain only function of lubrication system in piston engine.	**03**
	(b)	Explain difference between two stroke and four stroke engine.	**04**
	(c)	Explain function of gas turbine jet engine with neat sketch.	**07**
		OR	
	(c)	With neat sketch explain fuel system of pressure feed system of an aircraft having wing mounted fuel tanks.	**07**
Q.3	**(a)**	Explain Water-Methanol Thrust Augmentation System with neat sketch.	**03**

	(b)	Classify and shortly explain four types of Gas Turbine Engines.	**04**
	(c)	Explain hydraulic system of retractable under carriage with diagram.	**07**

OR

Q.3	**(a)**	Only draw control column and related control system accessories with nomenclature.	**03**
	(b)	Classify and shortly explain types of hydraulic actuators with neat sketch.	**04**
	(c)	Explain systems of nozzle of a turbojet engine or low bypass turbofan engine with neat sketch.	**07**
Q.4	**(a)**	Only draw different types of servo arms.	**03**
	(b)	With neat sketch explain Thrust Reversal technique.	**04**
	(c)	Explain the system which provides pressurized air supply to cockpit and passenger cabin.	**07**

OR

Q.4	**(a)**	Only draw cable end terminals.	**03**
	(b)	Only draw types of pulleys and shortly explain problems related to pulleys used for aircraft control system of primary control surfaces.	**04**
	(c)	Explain dry sump system with neat sketch. What happens if oil is drained from the system?	**07**
Q.5	**(a)**	Only draw eye end and pushrod assembly with nomenclature.	**03**
	(b)	Classify four types of propeller with respect to pitch. Explain each type	**04**
	(c)	With neat sketch explain design of joystick and related accessories with respect to single control and dual control system.	**07**

OR

Q.5	**(a)**	Explain importance of Manifold pressure gauge with neat sketch.	**03**
	(b)	Only draw bell crank, control horn and turn buckles.	**04**
	(c)	Draw and explain network of cable control system of a rudder,	**07**

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