

MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution



Model Question Paper

Fourth Semester BE Degree Examination

Aircraft Systems and Instrumentation

Time: 3 Hours

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1			M	L	C
Q1	a.	With neat labeled diagrams, explain hydraulic system components and its functions.	06	L2	CO1
	b.	Explain the basic air cycle layout using a neat sketch, discuss where it is used and compare it with vapour cycle system.	06	L2	CO1
	c.	Differentiate between de-icing and anti-icing systems used in aircraft and highlight the advantages and disadvantages of each.	08	L2	CO1
OR					
Q2	a.	Explain the components of the push-pull rod system using an illustration and differentiate this system with a power-assisted flight control system.	06	L2	CO1
	b.	With neat labelled sketch explain the electric system layout on a light aircraft	06	L2	CO1
	c.	Compare gravity fed and pump fed fuel systems and discuss the merits and demerits of each.	08	L2	CO1
Module- 2					
Q3	a.	Sketch and explain the block diagram for an Air Data Computer.	10	L2	CO2
	b.	Compare the basic characteristics and applications of a HUD and an HMD.	10	L2	CO2
OR					
Q4	a.	Summarize the importance and use of Multifunction Display	10	L2	CO2
	b.	Sketch and explain the air data system used to measure airspeed and altitude.	10	L2	CO2
Module – 3					
Q5	a.	Give explanations and choose the best type of gyroscope for: i. ICBM, ii. missile terminal guidance and iii. hot air balloon	10	L2	CO3
	b.	Explain the major characteristics of a mechanical gyroscope and compare it with electronic gyroscopes	10	L2	CO3
OR					
Q6	a.	Give an example of a for a non-vacuum driven gyroscope in an aircraft and explain the need for such a device.	10	L2	CO3
	b.	Sketch and explain the working principle of a Laser Ring Gyroscope	10	L2	CO3
Module – 4					
Q7	a.	A Wheatstone bridge circuit is constructed to measure strain in a component of a beam. All resistors and strain gages are nominally 150 ohms. The strain gage	10	L3	CO4

		factor is 2.10 which results in a change in resistance of R4 to 190 ohms. The supply voltage to the bridge is 5.00 V. With no load, the bridge is balanced ($V_o = 0$). Draw the circuit which is described above and calculate the output voltage based on the resistance change R4.			
	b.	Construct the fuel level measurement used in aircraft, give suitable reasons	10	L3	CO4
OR					
Q8	a.	A type J thermocouple is placed into an engine to measure the temperature. An ice bath is used as a reference junction in the normal fashion. The output voltage is 4.005 mV. Calculate the temperature of the oven. If ambient air ($T_{\text{ambient}} = 20^{\circ}\text{C}$) were used as the reference junction instead of the ice bath, what voltage would the thermocouple instrument read?	10	L3	CO4
	b.	Apply linear and rotary potentiometers used in an aircraft for specific situations	10	L3	CO4
Module – 5					
Q9	a.	Explain the Flight Data Recorder	10	L2	CO5
	b.	Justify the need and application of ACMS in aircraft maintenance.	10	L2	CO5
OR					
Q10	a.	Compare PCM Encoding and PCM Data Acquisition System	10	L2	CO5
	b.	Write a short note on Quick Access Recorder	10	L2	CO5
