

**Model Question Paper****Seventh Semester BE Degree Examination****Fundamentals of Guided Missiles****Time: 3Hours (180 Minutes)****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)	Explain the classification of strategic and tactical missiles with suitable examples.	10	L2	CO1
	b)	Describe the major subsystems of a guided missile with a neat block diagram.	10	L2	CO1
OR					
Q2	a.	Explain the propulsion phases of missiles and their significance in missile flight.	10	L2	CO1
	b.	Classify the different types of warheads and fuze mechanisms used in missile systems.	10	L2	CO1
Module- 2					
Q3	a.	A missile wing has an area of 3 m ² and is flying at 250 m/s at sea level where air density is 1.225 kg/m ³ . If the lift coefficient (C _L) = 0.8, calculate the lift force acting on the missile.	10	L3	CO2
	b.	A missile has a drag coefficient of 0.035 and a reference area of 2.8 m ² . If it flies at 300 m/s in air with density 1.2 kg/m ³ , determine the drag force.	10	L3	CO2
OR					
Q4	a.	The lift force on a missile is 12,000 N when flying at 200 m/s. Air density = 1.225 kg/m ³ , Wing area = 4 m ² . Determine the lift coefficient C _L	10	L3	CO2
	b.	A missile is flying at 280 m/s at an altitude where air density is 1.1 kg/m ³ . The reference wing area is 3.5 m ² and lift coefficient = 0.75. Calculate the lift force acting on the missile.	10	L3	CO2
Module - 3					
Q5	a.	A rocket engine produces a thrust of 20 kN with a mass flow rate of 12 kg/s. Calculate the effective exhaust velocity.	10	L3	CO3
	b.	Derive the burning rate relation for solid propellant rockets and explain the construction and working of a solid propellant rocket motor.	10	L3	CO3
OR					
Q6	a.	A ramjet engine has a mass flow rate of 15 kg/s and exhaust velocity of 1800 m/s. Calculate the thrust produced.	10	L3	CO3
	b.	Derive the thrust expression for air-breathing propulsion systems and apply it to compare turbojet, ramjet and scramjet engines used in missile propulsion	10	L3	CO3
Module – 4					
Q7	a.	Explain the concept of strategic missile guidance and discuss its importance in long-range missile operations.	10	L2	CO4
	b.	Describe the command guidance system with advantages and limitations.	10	L2	CO4

OR

Q8	a.	Explain the beam rider guidance technique used in missiles.	10	L2	CO4
	b.	Elaborate on homing guidance systems and their types with applications.	10	L2	CO4
Module – 5					
Q9	a.	Explain the principle of inertial navigation system used in missiles.	10	L2	CO5
	b.	Describe the strapdown navigation system and stabilised platform system.	10	L2	CO5
OR					
Q10	a.	Explain the working principle of Global Positioning System (GPS) in missile navigation.	10	L2	CO5
	b.	Examine TERCOM and terminal guidance techniques used in modern missile systems.	10	L2	CO5
