

**UNIT-V**

S.No.	Questions	BT	CO	PO
<b>Part – A (Short Answer Questions)</b>				
1	List out the factors which are to be considered for the comparison of different types of Rockets?	L1	CO5	PO1,PO2
2	List out the desirable properties required for liquid propellant rockets	L2	CO5	PO1,PO2
3	Why propeller engines are not recommended now days in air craft's?	L3	CO5	PO1,PO2
4	Explain thrust augmentation used in jet and rocket propulsion.	L2	CO5	PO1,PO2
5	State the fundamental difference between the jet propulsion and rocket propulsion.	L2	CO5	PO1,PO2
6	Derive the expressions for thermal efficiency of thrust and thrust power	L2	CO5	PO1,PO2
7	Explain the principle and working of liquid propellant rocket engine with neat sketch.	L4	CO5	PO1,PO2
8	What are the various propulsive devices for aircrafts and missiles?	L2	CO5	PO1,PO2
9	How rockets are classified? What is the essential difference between rocket propulsion and turbojet propulsion	L2	CO5	PO1,PO2
10	Describe the operation of ramjet engine.	L2	CO5	PO1,PO2
11	a) Showing the basic components, explain the working of turbojet engine.	L3	CO5	PO1,PO2
	b) turbojet is flying with a speed of 850 KMPH at an altitude, where air density is 0.17 kg/m <sup>3</sup> . The propulsive and overall efficiencies are 55% and 17% respectively. If the drag on air craft is 6000 N, calculate the exit velocity of jet, diameter of jet and propulsive power.	L3	CO5	PO1,PO2
12	a) What are the desirable properties of a liquid propellant for a rocket engine?	L3	CO5	PO1,PO2
	b) Derive the expressions for thermal efficiency of thrust and thrust power	L3	CO5	PO1,PO2
13	A turbojet engine flying at a speed of 800 km/hr consumes air at the rate of 45 kg/s. Calculate i) jet exit velocity, the change in enthalpy for the nozzle is 190 kJ/kg and the velocity coefficient is 0.95, ii) fuel flow in kg/hr and thrust specific fuel consumption, assuming that air-fuel ratio is 80:1, iii) thermal efficiency of plant given calorific value of fuel used is 43890 kJ/kg, iv) propulsive power and thrust power and v) propulsive efficiency and overall efficiency.	L3	CO5	PO1,PO2
14	For a rocket engine, jet velocity is 1600 m/s, flight to jet speed ratio is 0.7. Oxidizer flow rate is 4 kg/s. Fuel flow rate is 1 kg/s. Heat of reaction per kg of exhaust gas is 2500 kJ/kg. Calculate the Thrust, specific impulse, propulsive efficiency, thermal and overall efficiency of rocket engine.	L3	CO5	PO1,PO2

15	a)	An aircraft fitted with a turbojet engine is flying at a higher altitude where, the ambient conditions are 0.07 bar pressure and 1 °C temperature. The flight speed is 800 kmph. Determine the rate of fuel consumption and thrust specific fuel consumption, when the thrust developed is 25000 N under the following conditions: Ram efficiency is 95%, total head pressure ratio across the compressor 5:1, isentropic efficiency of compressor is 85%, isentropic efficiency of turbine is 90%. Consider an isentropic nozzle with expansion upto the ambient pressure. Take C.V. of the fuel as 42 MJ/kg.			
	b)	What is meant by thrust augmentation? When is it necessary?	L3	CO5	PO1,PO2
16		A jet plane having 2 jets works on turbo-jet system. It flies at a speed of 800km/hr at an altitude where density of air is 0.15 kg/m <sup>3</sup> . The propulsive efficiency is 55%. The drag on the plane is 6500N. Calculate i) Absolute velocity of jet ii) quantity of compressed air and iii) diameter of jet.	L3	CO5	PO1,PO2