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Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026

Aircraft Propulsion

Time: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.



Module – 1			M	L	C
Q.1	a.	Explain the working principle of turbojet engines with a neat sketch and write advantages and disadvantages.	10	L2	CO2
	b.	Describe the working principle of 4 stroke petrol engine with sketch.	10	L2	CO2
OR					
Q.2	a.	With P.V and T-S diagram explain Brayton cycle also derive the expression for network output and efficiency.	12	L2	CO2
	b.	Write the advantage of gas turbine engines over the reciprocating engines.	8	L2	CO2
Module – 2					
Q.3	a.	Enlist the theories used in design propellers. Explain advanced blade element theory of propeller.	10	L3	CO3
	b.	Define Thrust and derive the thrust equation for turbofan engine.	10	L3	CO3
OR					
Q.4	a.	List the methods of Thrust Augmentation. Explain Afterburner with sketch.	10	L2	CO2
	b.	Discuss the performance characteristics of Turbojet engine.	10	L2	CO2
Module – 3					
Q.5	a.	What is the purpose of inlets in gas turbine engines? Briefly explain supersonic inlets.	10	L2	CO2
	b.	Explain about the starting problem associated with supersonic inlets and explain phenomenon of shock swallowing.	10	L2	CO2
OR					
Q.6	a.	Write short notes on : i) Thrust reverser and thrust vectoring with sketch ii) Nozzle chocking.	5 5	L2 L2	CO2 CO2
	b.	Describe over expanded and under expanded nozzles with neat sketch.	10	L2	CO2

Module – 4

Q.7	a.	Draw a schematic diagram, explain the principle operation of centrifugal compressor.	10	L1	CO1
	b.	A centrifugal compressor running at a speed of 11,500 rpm with inlet temperature of 21°C has inlet and outlet pressure as 1 bar and 4 bar. The diameter of impeller is 75 cm and slip factor 0.92. Determine compressor efficiency.	10	L4	CO4

OR

Q.8	a.	Explain the following for an centrifugal compressor : i) Concept of pre-whirl and rotating stall ii) Performance characteristics of centrifugal compressor.	10	L1	CO1
	b.	Explain the following : i) Compressor blade design for axial flow compressor. ii) Axial compressor performance characteristics.	10	L2	CO2

Module – 5

Q.9	a.	Explain the process of combustion in a gas turbine.	10	L1	CO2
	b.	Brief the flame stabilizing with neat diagram.	10	L2	CO2

OR

Q.10	a.	Discuss various turbine cooling methods used for gas turbine engine.	10	L2	CO2
	b.	With neat sketch, explain the working of impulse and reaction stages in turbine with their differentiation.	10	L1	CO1
