CBCS SCHEME

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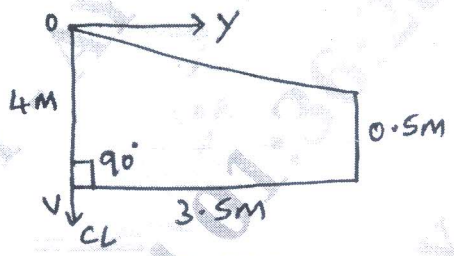
BAE302

Third Semester B.E./B.Tech. Degree Examination, June/July 2024
Elements of Aeronautics

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 with neat sketch monocoque, semi minocoque and tress structure of aircraft.	10	L2	CO1
	b.	Explain in detail with application, metallic and non metallic materials use in aircrafts.	10	L2	CO1
		OR			
Q.2	a.	Explain with neat sketch, the principle operation of helicopter and their functions.	12	L2	CO1
	b.	Analyze the effectiveness of high lift devices? Give its classification.	8	L3	CO1
		Module – 2			
Q.3	a.	For the given plan form find : i) L.E sweep ii) $\frac{1}{4}$C line sweep iii) Aspect ratio iv) MAC v) x, y Co-ordinates of $\frac{1}{4}$C of MAC.  Fig Q3(a)	10	L3	CO2
	b.	Explain spoilers and air brakes.	4	L2	CO2
	c.	Analyze the following NACA airfoils i) NACA 2415 ii) NACA 23012 iii) NACA 632-2/8.	6	L3	CO1
		OR			
Q.4	a.	Explain how does a pressure distribution over a wing section occur.	10	L3	CO2
	b.	If an airplane is flying at an altitude where actual pressure and temperature are $4.7z \times 10^4 N/m^2$ and 255.7k respectively. What are the pressure, temperature and density altitudes?	10	L3	CO2
		Module – 3			
Q.5	a.	What are the factors to be considered while selecting a power plant for an aircraft?	8	L4	CO2

	b.	With a neat sketch, explain 'Turbofan' Engine and write about Bypass ratio and its significance.	12	L2	CO2
		OR			
Q.6	a.	With the help of PV and T-S diagram, explain Brayton's cycle. Give its application in jet engines.	10	L2,3	CO2
	b.	What is thrust augmentation? Explain different thrust augmentation methods.	10	L2	CO2
		Module – 4			
Q.7	a.	With a neat sketch, explain conditions of static and dynamic stability of an aircraft.	10	L2	CO3
	b.	Analyze with neat diagram the contribution of control surfaces in maintaining aircraft stability and control.	10	L3	CO3
		OR			
Q.8	a.	Explain with a characteristics chart effect of power and altitude on performance of the aircraft.	10	L2	CO2
	b.	Explain with neat sketch inverted maneuvers of aircraft.	10	L2	CO3
		Module – 5			
Q.9	a.	What is meant by system? What are the functions of aircraft system? List the system required for an aircraft.	10	L2	CO3
	b.	Describe the working of a typical aircraft hydraulic system.	10	L1	CO3
		OR			
Q.10		Write short notes on any five : a) Altimeter b) Turn coordinator c) Air speed indicator d) Communication system e) Navigation aids f) Weather system.	20	L2	CO2

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