CBCS SCHEME

USN

BAE301

Third Semester B.E./B.Tech. Degree Examination, June/July 2024
Aircraft Materials and Processes

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 strain hardening with a neat sketch.	06	L1	CO1
	b.	With the help of a neat sketch, explain the stress-strain diagram for the ductile and brittle materials.	10	L2	CO1
	c.	Write a note on any one Hardness Testing Machine.	04	L2	CO1
		OR			
Q.2	a.	Discuss Bauschinger effect in detail.	10	L2	CO1
	b.	Explain the key factors of material properties required for the aerospace application.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the surface treatment in alloys.	08	L2	CO2
	b.	Write a note on Titanium and its alloys.	08	L1	CO1
	c.	Name few components in an aircrafts made using magnesium and its alloys.	04	L3	CO2
		OR			
Q.4	a.	Define adhesives and sealants. Give their application in aircrafts.	10	L2	CO2
	b.	What is seasoning of wood? Explain the defects in wood.	10	L2	CO2
		Module – 3			
Q.5	a.	Explain the composition, properties and applications of low carbon steels and low alloy steels.	10	L2	CO2
	b.	Elucidate the types, properties and applications of maraging steel.	10	L2	CO2
		OR			
Q.6	a.	What are super alloys? Write a note on Nickel based super alloys and its application in aircraft.	10	L2	CO2
	b.	Explain the different types of heat treatment carried out on super alloy.	10	L2	CO2
		Module – 4			
Q.7	a.	Define ceramic materials. Discuss their classifications and characteristics in detail.	10	L2	CO3
	b.	Explain the role of matrix and reinforcement in composite materials. List the various composite materials used in aircraft.	10	L2	CO3
		OR			
Q.8	a.	Explain the following: (i) Carbon-carbon composites (ii) Metal matrix composites	10	L2	CO3
	b.	With the help of a neat sketch, explain the fabrication process of metal matrix composites and its application in aircraft.	10	L3	CO3
		Module – 5			
Q.9	a.	Explain the corrosion protection process for materials used in aircraft applications.	10	L2	CO3
	b.	What are the factors considered while selecting a ceramic coating? Explain its advantages.	10	L3	CO3
		OR			
Q.10	a.	Distinguish between the destructive and non-destructive testing methods.	10	L4	CO3
	b.	Name few types of inspection methods for crack detection. Explain any one method in detail.	10	L4	CO3

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