CBCS SCHEME

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BAE301

Third Semester B.E./B.Tech. Degree Supplementary 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.	What are the desirable properties of materials used for aircraft applications? Briefly explain them.	08	L2	CO1
	b.	Name and explain the requirements that are considered for the selection of materials for airframes.	06	L2	CO1
	c.	Explain stress-strain curves for ductile and brittle materials.	06	L2	CO1
		OR			
Q.2	a.	Name the different types of material testing machines used and explain them briefly.	08	L2	CO1
	b.	With a neat sketch explain Bauchinger's effect.	06	L2	CO1
	c.	Define NDT. Explain ultrasonic flow detection system.	06	L2	CO1
		Module – 2			
Q.3	a.	Name the alloy, which is used for manufacturing majority of fuselage skin, explain properties and applications of the same.	08	L2	CO2
	b.	Discuss the properties, importance of applications of titanium alloy.	06	L2	CO2
	c.	Explain carbon-carbon composite and metal matrix composite.	06	L2	CO2
		OR			
Q.4	a.	Differentiate between cast and wrought alloys. Also explain the properties and application of magnesium and its alloys.	08	L2	CO2
	b.	Discuss the properties and applications of i) Plastic ii) Glass iii) Rubber	06	L2	CO2
	c.	Explain the properties and applications of copper and its alloys.	06	L2	CO2
		Module – 3			
Q.5	a.	Write a note on: i) Nickel based super alloys ii) Cobalt based super alloys	08	L2	CO3
	b.	Define Maraging Steel? Explain the properties and applications of Maraging Steel.	06	L2	CO3
	c.	Briefly explain Heat resistant steel and Corrosion resistant steels.	06	L2	CO3
		OR			
Q.6	a.	Explain the classification of steel? Also explain the applications of plain carbon steels.	08	L2	CO3
	b.	Write a note on High Speed Steel (HSS)	06	L2	CO3
	c.	Explain the heat treatment process of Superalloys.	06	L2	CO3
		Module – 4			
Q.7	a.	Define ceramic materials. How are they classified? Briefly explain the characteristics of ceramic materials.	08	L2	CO3
	b.	Differentiate between thermoplastics and thermosets.	06	L2	CO3
	c.	Explain the manufacturing and forming methods of metal matrix composites.	06	L2	CO3

		OR			
Q.8	**a.**	Briefly explain the properties and applications of ceramic materials	**08**	**L2**	**CO3**
	b.	Define Cermets. Explain the properties and applications of cermets.	**06**	**L2**	**CO3**
	c.	Write a note on production of carbon/carbon composites.	**06**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Explain the following corrosion protection processes: i) Cleaning operations ii) Plating operations	**10**	**L2**	**CO3**
	b.	What do you mean by destructive and non-destructive testing methods? List the different tests on under destructive and non-destructive tests. Explain any one from each test.	**10**	**L2**	**CO3**
		OR			
Q.10	**a.**	Define Corrosion. Explain the detection and prevention process of corrosion.	**10**	**L2**	**CO3**
	b.	Explain the following with neat sketch and explanation of any two: i) Dye-Penetrant test ii) Eddy current test iii) X-ray radiography iv) Ultrasonic testing	**10**	**L2**	**CO3**

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