Reg. No.															

B.Tech / M.Tech (Integrated) DEGREE EXAMINATION, JULY-2024
Third Semester

21ASC207T - AIRCRAFT MATERIALS AND PRODUCTION TECHNIQUES
(For the candidates admitted from the academic year2022 - 2023 onwards)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours

Max. Marks: 75

PART - A (20 x 1 = 20 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
1.	The ability of a material to plastically deform under tensile load is _____ A) Brittleness B) Toughness C) Ductility D) Hardness	1	1	1	1
2.	_____maintains the shape of the aircraft wing A) Wing Skin B) Wing Rib C) Wing Spar D) Wing Stiffeners	1	1	1	1
3.	Which aerospace material possesses high specific strength and specific stiffness? A) Aluminium Alloys B) Titanium Alloys C) Fiber Reinforced Plastic Composites D) Super Alloys	1	1	1	1
4.	Rotor hub is attached to the top of _____ A) Boom B) Transmission Shaft C) Propeller Shaft D) Mast	1	1	1	1
5.	Heat treatment is the_____ A) Controlled heating & cooling B) Controlled heating C) Controlled cooling D) Uncontrolled heating & cooling	1	1	2	1
6.	In heat treatment, Annealing is performed to _____ A) Improve Hardness B) Reduce Hardness C) Reduce Toughness D) Remove Defects	1	1	2	1
7.	_____ have high alloy content A) Maraging Steels B) Mild Steel C) Medium-Carbon Steels D) HSLA Steel	1	1	2	1
8.	_____is also called as gas-cyaniding A) Carburizing B) Nitriding C) Carbonitriding D) Cyaniding	1	1	2	1
9.	A Riser is also known as _____ A) Feedhead B) Ingate C) Core Seat D) Downgate	1	1	3	1
10.	The function of core is to_____ A) Remove dissolved gases B) Avoid casting defects C) Form Hollow Region D) Reduce Shrinkage Region	1	1	3	1

11.	_____ supports the cores inside the mold cavity A) Runner B) Pattern C) Riser D) Chaplets	1	1	3	1
12.	Which of the following is not a welding defect? A) Crater B) Overlap C) Pinholes D) Necklace Cracking	1	1	3	1
13.	_____ is performed above the recrystallization temperature but below the melting point. A) Casting B) Cold working C) Hot working D) Strain Hardening	1	1	4	1
14.	The extra metal which settles down in the gutter is called as _____ A) Slag B) Flash C) Flux D) Barrel	1	1	4	1
15.	Moving mandrel is employed in _____ A) Metal cutting B) Wire Drawing C) Forging D) Tube Drawing	1	1	4	1
16.	Which of following is a rolling defect? A) Spattering B) Springback C) Alligatoring D) Coldshut	1	1	4	1
17.	The body of single point cutting tool is called _____ A) Rake B) Shank C) Major Flank D) Minor Flank	1	1	5	1
18.	The operation of cutting internal threads in a drilled hole is known as _____ A) Lapping B) Tapping C) Mapping D) Trapping	1	1	5	1
19.	The grains of abrasive grinding wheel are called as _____ A) Particle B) Grit C) Filler D) Debris	1	1	5	1
20.	In a shaping machine, _____ act as a cover to the drive mechanism and also supports the reciprocating ram. A) Base B) Cross rail C) Column D) Tool Head	1	1	5	1

PART - B (5 x 8 = 40 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
21 a.	Explain the components of a jet engine with a neat sketch. Describe the different materials used in a jet engine.	8	2	1	1
	(OR)				
b.	Explain about the requirements and factors for the selection of aerospace materials.	8	2	1	1
22 a.	Explain the principle of heat treatment and discuss their different stages in detail. Describe the purpose of heat treatment.	8	2	2	1
	(OR)				
b.	Define case hardening and describe its types. Discuss the process of flame hardening with a neat sketch.	8	2	2	1
23 a.	Explain the process of investment casting with a neat sketch. Discuss the advantages, and its limitations.	8	2	3	1

(OR)

b.	Explain the working operation and types of welding flame in Oxy-fuel gas welding with a neat sketch. Discuss the advantages and its limitations.	8	2	3	1
24 a.	Describe the forging process and classify its types. Explain upset forging process with a neat sketch.	8	2	4	1

(OR)

b.	Describe the different types of shearing dies. Explain the operation of progressive dies in detail with a neat sketch.	8	2	4	1
25 a.	Explain the components, working principle and different operations performed in a lathe machine with neat sketch.	8	2	5	1

(OR)

b.	Explain the components, working principle and different operations performed in a drilling machine with neat sketch.	8	2	5	1

PART - C (1 x 15 = 15 Marks)
Answer **ANY ONE** Question

		Marks	BL	CO	PO
26.	Explain about the space shuttle structures with a neat sketch. Discuss on the various materials used in space shuttle structures.	15	2	1	1
27.	Explain about the fiber reinforced plastic composites used in aircraft structures. Describe the constituent, classifications of fiber reinforced plastics. Discuss the advantages, limitations and its aerospace applications.	15	2	1	1

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