

Total No. of Questions: 6

Total No. of Printed Pages: 3

Enrollment No.....



Programme: B.Tech.

Branch/Specialisation: AU

Faculty of Engineering

End Sem Examination Dec 2024

AU3CO57 Manufacturing Technology

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

	Marks	BL	PO	CO	PSO
Q.1 i. Which property of molding sand is crucial for withstanding the heat of molten metal without breaking down?	1	1	1	1	1
(a) Permeability (b) Cohesiveness (c) Refractoriness (d) Plasticity					
ii. Which molding process uses resin-coated sand that is baked to form a shell?	1	2	2	1	2
(a) Fluid sand process (b) CO ₂ process (c) Shell molding (d) Hot-box method					
iii. What is a common cause of porosity in castings?	1	3	4	2	1
(a) Excessive pouring temperature (b) Insufficient mold drying (c) Improper gating design (d) Incorrect alloy composition					
iv. Which of the following is a major design criterion for the pouring basin in a gating system?	1	4	3	2	1
(a) To store molten metal until it cools completely (b) To regulate the flow of molten metal and minimize turbulence (c) To create a vacuum in the mold cavity (d) To maintain the shape of the solidified casting					

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|-------|---|----------|---|---|---|---|
| v. | In forging, which of the following defects is typically caused by excessive working pressure? | 1 | 1 | 4 | 3 | 1 |
| | (a) Surface cracking (b) Lamination
(c) Buckling (d) Pitting | | | | | |
| vi. | Which rolling process typically produces sheets of uniform thickness with a fine surface finish? | 1 | 3 | 3 | 3 | 2 |
| | (a) Hot rolling (b) Cold rolling
(c) Open-die forging (d) Drop forging | | | | | |
| vii. | In which welding process is shielding gas NOT typically required? | 1 | 2 | 5 | 4 | 1 |
| | (a) MIG welding (b) TIG welding
(c) Friction welding (d) Plasma arc welding | | | | | |
| viii. | What does the 'E' signify in the electrode code 'E6013'? | 1 | 1 | 1 | 4 | 2 |
| | (a) Electrode size
(b) Welding position
(c) Electrode type
(d) Electrical charge | | | | | |
| ix. | What is the main purpose of the compaction step in powder metallurgy? | 1 | 2 | 6 | 5 | 1 |
| | (a) To create fine powder particles
(b) To reduce the porosity of the material
(c) To increase powder grain size
(d) To create an oxide layer on the surface | | | | | |
| x. | One of the main challenges in shaping glass is: | 1 | 4 | 4 | 5 | 2 |
| | (a) Controlling thickness and uniformity
(b) Achieving high flexibility
(c) Increasing thermal conductivity
(d) Avoiding chemical reactions | | | | | |
| Q.2 | i. What are core prints used for in mold making?
ii. Describe the CO ₂ process in core making.
iii. Discuss the different types of molding sands. | 2 | 2 | 1 | 1 | 1 |
| | | 3 | 3 | 2 | 1 | 2 |
| | | 5 | 2 | 1 | 1 | 1 |
| OR | iv. Evaluate the different testing methods for molding sand, including their purpose and the properties they assess. | 5 | 4 | 4 | 1 | 1 |

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| Q.3 | i. Explain the process of calculating pouring time in casting and the factors that affect it. | 3 | 3 | 2 | 2 | 2 |
| | ii. Discuss the types of casting processes, including their advantages, disadvantages, and typical applications. | 7 | 2 | 6 | 2 | 2 |
| OR | iii. Explain the design criteria for pouring basins, sprues, runners, and risers in a gating system, including how they influence casting quality. | 7 | 4 | 3 | 2 | 1 |
| Q.4 | i. Explain the three primary differences between hot working and cold working. | 3 | 2 | 1 | 3 | 1 |
| | ii. Describe the different types of rolling mills and their applications in bar and shape rolling. | 7 | 2 | 3 | 3 | 1 |
| OR | iii. Define any seven sheet metal working processes with diagram. | 7 | 1 | 1 | 3 | 2 |
| Q.5 | i. Describe the process of explosive welding, including its applications and specific advantages. | 3 | 2 | 5 | 4 | 1 |
| | ii. Discuss the Tungsten Inert Gas (TIG) welding with its advantages, limitations, and applications. | 7 | 2 | 1 | 4 | 1 |
| OR | iii. Explain gas welding with types of flame, its specific uses, advantages and applications. | 7 | 2 | 2 | 4 | 1 |
| Q.6 | i. Define powder metallurgy and discuss its advantages. | 3 | 1 | 1 | 5 | 2 |
| | ii. Explain the main processes and operations involved in powder metallurgy. | 7 | 2 | 6 | 5 | 2 |
| OR | iii. Discuss the forming and shaping processes of glass and their applications. | 7 | 2 | 3 | 5 | 2 |

Marking Scheme			
AU3CO57 (T) Manufacturing Technology (T)			
Q.1	i) c) Refractoriness ii) c) Shell molding iii) c) Improper gating design iv) b) To regulate the flow of molten metal and minimize turbulence v) a) Surface cracking vi) b) Cold rolling vii) c) Friction welding viii) c) Electrode type ix) b) To reduce the porosity of the material x) a) Controlling thickness and uniformity	1 1 1 1 1 1 1 1 1 1	ii. TIG- 5 marks advantages, limitations, and applications- 2 marks OR iii. Gas welding- 2 marks Types of flames-3 marks specific uses, advantages and applications- 2 marks
Q.2	i. 2 marks ii. 3 marks iii. 1 marks each 1X5 marks OR iv. Any 5 test 1X5 marks	2 3 5 5	Q.6 i. 3 marks ii. All processes 7 marks iii. 7 marks
Q.3	i. 3 marks ii. Casting- 1marks Types- 3marks Advantages-1 marks Disadvantsges-1 marks Application-1 marks OR iii. 2 marks each (2 X 3)- 6marks Effect-1 marks	3 7 7	*****
Q.4	i. 1 marks each (1X3)- 3 marks ii. (1 X 5)- 5 marks Applications- 2 marks OR iii. 1X7- 7 marks	3 7 7	
Q.5	i. Process- 1 marks Application- 1 marks Specific advantages- 1 marks	3	

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