K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:III
Class:SY	Program:B.Tech
Branch Code:MEC	Pattern:2023
Name of Course:Manufacturing Processes	Course Code:2305201
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	Explain the different types of moulding sand used in casting and discuss how the selection of improper sand type can lead to casting defects.	(6)	CO1
Question No. 2			
2a)	Classify the different types of forging processes and explain the closed-die forging process. Discuss possible defects that may occur in this process due to improper process parameters.	(6)	CO1
Question No. 3			
3a)	List the different types of bending operations used in sheet metal forming and explain the mechanism of any two operations with neat sketches.	(8)	CO2
	OR		
3b)	Explain the working mechanism of a progressive die and a combination die used in sheet metal forming operations with neat sketches.	(8)	CO2
3c)	A compound die will be used to blank and punch a large washer out of aluminium alloy sheet stock 3.80 mm thick. The outside diameter of the washer is 60.0 mm and the inside diameter is 28.0 mm. Determine (a) the punch and die sizes for the blanking operation, (b) the punch and die sizes for the punching operation, and (c) Blanking force required if the aluminium has a shear strength 320 MPa Take allowance 6% of sheet thickness	(8)	CO2
	OR		
3d)	A part of length 10 mm and height 20 mm is to be made from sheet of 2 mm thick and 1000 mm length. Determine: i) Stock Strip layout ii) No of parts produced iii) % utilization of strip.	(8)	CO2

Question No. 4

4a)	Explain the types of polymers based on their structure and relate how their structural arrangement affects the manufacturing process.	(8)	CO3

OR

4b)	Explain the characteristics of thermoplastic and thermosetting polymers and relate their behavior with suitable manufacturing processes.	(8)	CO3
4c)	Discuss the process which uses for creating hollow plastic products with neat sketch.	(8)	CO3

OR

4d)	Explain the principle of thermoforming and describe any one thermoforming process, relating it to the behaviour of thermoplastic materials, with a well-labelled sketch.	(8)	CO3

Question No. 5

5a)	Apply your understanding of additive manufacturing techniques to explain the process that uses thin-coated sheets as a material for producing components.	(8)	CO4

OR

5b)	Demonstrate your knowledge of powder bed fusion additive manufacturing techniques which uses C02 laser. Identify and describe the industrial applications where this technique is commonly used.	(8)	CO4
5c)	Apply your understanding of additive manufacturing to describe the process steps implemented for producing a functional prototype of a mechanical component.	(8)	CO4

OR

5d)	Analyze the concept of Rapid Tooling in manufacturing.	(8)	CO4

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