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:ROB	Pattern:2023
Name of Course:Manufacturing Technology	Course Code:2312203
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 2 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 and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	What is a gating system? Explain the principles of 'Progressive Solidification' and 'Directional Solidification' and why they are crucial for producing a defect-free casting.	(6)	CO1
Question No. 2			
2a)	Explain the 'Theory of Plasticity' as it applies to metal forming. Differentiate between a forging 'Hammer' and a forging 'Press' based on their operation and application.	(6)	CO2
Question No. 3			
3a)	Compare 'Direct Extrusion' and 'Indirect Extrusion' with diagrams, highlighting the differences in friction and force required. Also, explain the 'Shape Factor' in extrusion.	(8)	CO3
	OR		
3b)	What are common defects found in extruded products? Explain the causes and remedies for any two of them.	(8)	CO3
3c)	Classify sheet metal cutting and forming operations. With neat sketches, explain the 'Bending' and 'Coining' operations.	(8)	CO3
	OR		
3d)	Explain the application of robots in 'Press Working'. What specific tasks can they perform, and what are the benefits to the manufacturing line?	(8)	CO3
Question No. 4			
4a)	A welding power source has a linear characteristic where the open-circuit voltage is 60 V and the short-circuit current is 100 A. The arc voltage is given by $V_{arc} = 25 + 2L$ (where L is arc length in mm). Find the welding current and power when the arc length is 4 mm.	(8)	CO4
	OR		
4b)	Explain the working principle of 'Plasma Arc Welding' (PAW). How does it differ from TIG welding, and what are its unique advantages?	(8)	CO4

4c)	Explain the 'Gas Welding' process. Describe the three types of flames with sketches and list their specific applications.	(8)	CO4

OR

4d)	Draw and explain the standard 'Welding Symbols' for a fillet weld and a V-groove butt weld. Why is the standardization of these symbols important in engineering drawings?	(8)	CO4

Question No. 5

5a)	Compare and contrast 'Electrochemical Machining' (ECM) and 'Electro-Discharge Machining' (EDM) based on: (i) Material removal mechanism, (ii) Tool material and wear, (iii) Working gap, and (iv) Suitable workpiece materials.	(8)	CO5

OR

5b)	Explain the working principle, advantages, limitations, and applications of 'Ion Beam Machining' (IBM).	(8)	CO5
5c)	Describe the 'Milling' operation. Differentiate between 'Up Milling' and 'Down Milling' with neat sketches, highlighting the effect on chip formation and forces.	(8)	CO5

OR

5d)	Explain the application of robots in machining processes. What specific tasks can they automate in operations like 'Turning' or 'Milling', and what are the benefits?	(8)	CO5

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