



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:2022
Name of Course:Manufacturing Technology	Course Code:ROB222002
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) CO2

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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