Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, Nov/Dec 2024

Manufacturing Engineering

III Semester

MF23303 & Forming Technology

(Regulation 2023)

Time: 3hrs | Max. Marks: 100

CO1	Illustrate deformation types and classification of forming processes
CO2	Describe bulk forming processes and their applications
CO3	Elaborate different sheet metal forming processes and their applications
CO4	Discuss powder forming processes and its applications
CO5	Elaborate various types of plastic forming processes and their applications

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	What is meant by plastic deformation? How does it differ from elastic deformation? (any four points)	2	1	2
2	Differentiate between warm working and hot working in metal forming. (any four points)	2	1	2
3	List the key process parameters in the rolling process. (any four points)	2	2	1
4	Differentiate between swaging and radial forging. (any four points)	2	2	2
5	What is meant by superplastic forming and mention one application.	2	3	1
6	What are the primary defects observed in sheet metal forming processes? (any four points)	2	3	1
7	Differentiate between powder extrusion and powder rolling. (any four points)	2	4	2
8	What is meant by particle size characterization, and why is it important in powder forming?	2	4	2
9	Mention four defects observed in injection molding and their possible causes.	2	5	1
10	Differentiate between blow molding and rotational molding. (any four points)	2	5	2

PART- B (5 x 13 = 65 Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	Discuss the classification of metal forming processes with suitable examples for each category in terms of products.	13	1	4
	OR			
11 (b)	Discuss briefly about strain rate sensitivity and its importance in metal forming processes.	13	1	4
12 (a)	Compare direct and indirect extrusion processes in detail, equipment used, possible defects and their causes.	13	2	3
	OR			
12 (b)	Explain the principle and operation of rod/wire drawing process. Discuss the factors affecting product quality.	13	2	3
13 (a)	Discuss any one high-energy-rate forming processes. Explain its working principle, application, advantages and limitations.	13	3	3
	OR			
13 (b)	Explain the deep drawing process, detailing its applications, advantages, limitations, and defects encountered.	13	3	3
14 (a)	Discuss in detail the various methods of powder production, highlighting their applications, advantages and limitations.	13	4	3
	OR			
14 (b)	Describe the blending and compacting processes in powder forming, focusing on their principles and challenges.	13	4	3
15 (a)	Compare injection moulding and transfer moulding processes with neat sketches. State their advantages, limitations and typical applications of each processes.	13	5	4
	OR			
15 (b)	Compare different types of thermoforming processes, highlighting their applications in the packaging and automotive industries.	13	5	4

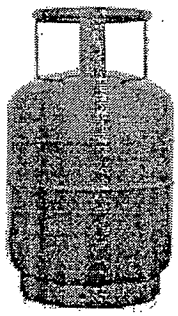
PART- C (1x 15=15Marks)

(Q.No.16 is compulsory)

Instructions

You are expected to address the following while answering question in PART - C

1. Name of the manufacturing processes involved (may be more than one processes in a single product)
2. The raw materials requirements and material type (form) for different parts of the product
3. Different components of the machine(s) used with neat sketches
4. Various stages involved in the making of the product
5. Process parameters to be considered for each machine
6. Die design (separate figure)
7. Advantages of the processes
8. Limitations of the processes
9. Alternative processes (if any)
10. Other points to be considered

Q.No.	Questions	Marks	CO	BL
16.	Discuss briefly the manufacturing processes involved in the making of gas cylinder with neat sketches (please read the above instructions before answering this question). 	15	5	5