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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, Nov / Dec 2023



Manufacturing

V Semester

MF5502 – Metal and Powder forming

(Regulation 2019)

Time: 3 hrs

Max. Marks: 100

CO 1	To describe types of deformations and classification of forming processes
CO 2	To classify and explain bulk forming processes
CO 3	To describe sheet metal forming processes
CO 4	To distinguish differences between conventional forming and special forming processes
CO 5	To elaborate various stages involved in the powder forming processes

BL – Bloom's Taxonomy Levels

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

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	Define the strain hardening coefficient.	2	CO 1	L2
2	List the metals that will be hot-worked at room temperature	2	CO 1	L2
3	What are the process parameters for the rolling operation?	2	CO 2	L4
4	State the property requirements for metal wire drawing.	2	CO 2	L1
5	List the difference between the punching and blanking operations.	2	CO 3	L2
6	Enumerate the anisotropic behaviour of sheet metal.	2	CO 3	L3
7	State the difference between incremental forming and conventional forming.	2	CO 4	L2
8	Define the fine blanking operation.	2	CO 4	L1
9	What is the difference between blending and the mixing of metal powders?	2	CO 5	L4
10	Which method is suitable for manufacturing cemented carbide tools? Give a reason.	2	CO 5	L4

PART- B (5 x 13 = 65 Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	State and explain the classification of metal working methods based on the force applied with neat illustrations.	13	CO1	L1
OR				
11 (b)	Make a difference between the hot working and cold working of aluminium bulk metal. Mention the advantages and disadvantages of both processes.	13	CO1	L1
12 (a)	Explain the effects of temperature, friction, and lubrication on rolling operations.	13	CO2	L3

OR				
12 (b)	Explain the optimum cone angle and dead zone development in wire drawing with the help of sketches.	13	CO2	L3
13 (a)	Explain and state the deep drawing process's principles. List the process parameters and provide detailed descriptions for each one. Give them some benefits and drawbacks.	13	CO3	L3
OR				
13 (b)	Explain the restrained and unrestrained electrohydraulic forming processes. Give some applications and the pros and cons of the processes.	13	CO3	L3
14 a)	Demonstrate the methods of hot and cold isostatic pressing with neat diagrams.	13	CO4	L3
OR				
14 (b)	(i) Explain the rubber pad forming with neat illustrations.	7	CO4	L3
	(ii) Explain the water hammer forming with appropriate diagrams	6	CO4	L3
15 (a)	Provide important illustrations demonstrating the design guidelines for powder-metallurgical manufactured parts with specific explanations.	13	CO5	L4
OR				
15 (b)	Describe the following powder production methods: gas atomization and mechanical milling.	13	CO5	L4

PART- C (1 x 15 = 15 Marks)
(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	Select the best powder metallurgical method for producing an automobile part's connecting rod. Explain complete step-by-step instructions for the selected method, including necessary diagrams.	15	CO5	L5

