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

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech (Full Time) - END SEMESTER (ARREAR) EXAMINATIONS, APRIL/MAY 2024

Manufacturing Engineering

Semester V

MF5502 METAL AND POWDER FORMING

(Regulations 2019)

ADDITIONAL CONTROLLER OF EXAMINATION AU CHENNAI 600 025

Time: 3 hrs | 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	Compare and distinguish conventional and special forming processes
CO5	Discuss powder forming processes and its applications

BL – Bloom's Taxonomy Levels

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

PART- A (10 x2 =20 Marks)

(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1.	Define stress and strain. Write its formula.	**2**	1	L1
2.	What is the effect of increase in temperature on ductility and Young's modulus of the material?	**2**	1	L3
3.	State true or false. "Yield strength increases during forging process." Justify your answer.	**2**	2	L3
4.	What is swaging process? Mention any two applications of it.	**2**	2	L2
5.	How spring back effect is compensated in sheet metal forming?	**2**	3	L3
6.	What is stretch forming process? Mention any two applications.	**2**	3	L2
7.	Differentiate between hot and cold isostatic pressing.	**2**	4	L3
8.	Mention any four applications of hydroforming process.	**2**	4	L2
9.	How will you determine the effective size of the particle and reduce the particle size to be used for powder metallurgy process?	**2**	5	L3
10.	List any four precautions that should be followed for handling with toxicity of powders.	**2**	5	L2

PART- B (5 x 13 = 65 Marks)

Q.No	Questions	Marks	CO	BL
11 (a)	Discuss the mechanism of elastic and plastic deformation in detail	**13**	1	L3
	OR			
11 (b)	Enumerate the effect of temperature in metal working. Make a comparison between cold, warm and hot working of metals.	**13**	1	L3

12 (a)	With neat schematic explain the rolling process with its types, defects, advantages and applications.	**13**	2	L2
	OR			
12 (b)	What is extrusion ratio? Explain the extrusion process and its types, defects and applications.	**13**	2	L2
13 (a)	Classify and explain any two high energy rate forming processes with neat diagram.	**13**	3	L3
	OR			
13 (b)	Identify and analyze the characteristics of metals, formability, design for manufacturing and economics for sheet metal forming processes.	**13**	3	L3
14 (a) i)	Compare orbital and isothermal forging process with diagram.	**8**	4	L4
ii)	Identify and prioritize the needs for high speed forming machines.	**5**	4	L4
	OR			
14 (b)	Discuss the rubber pad forming process with its design considerations, effect of process parameters, advantages and applications.	**13**	4	L4
15 (a)	Classify different powder production methods and explain any one methods in each category with necessary diagram.	**13**	5	L3
	OR			
15 (b)	Compile sintering theory, types, mechanism, stages and environment related to sintering process with its applications.	**13**	5	L3

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

Q.No	Questions	Marks	CO	BL
16. (i)	Identify, analyze and device the various metal forming processes and steps involved in the production of LPG gas cylinder, cam shaft, leaf spring, fuel tank and metal filters.	**15**	2,5	L5