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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B. E. - Mechanical Engineering

Semester End Examination; July / Aug. - 2022

Manufacturing Process - II

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1 - Describe different metal working processes and its applications.
CO2 - Illustrate metal working processes.
CO3 - Analyse stresses and strain rate in metal working processes.
CO4 - Explain powder metallurgy process.
CO5 - Discuss processing of plastics and ceramics.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*
*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks
	I : PART - A	**10**
I a.	What are the advantages of metal working process?	2
b.	Define Forging.	2
c.	How is extrusion process classified?	2
d.	What is drawaility and LDR?	2
e.	What is compaction and sintering?	2
	II : PART - B	**90**
	UNIT - I	**18**
1 a.	Classify metal forming process based on the nature of forces applied. Illustrate them with neat diagram.	9
b.	Derive the relationship between True Stress - Conventional Stress and True Strain Conventional Strain.	9
c.	What is hydrostatic stress? What is its influence on metal working process?	9
	UNIT - II	**18**
2 a.	Derive an expression for the maximum forging load in plane forging $P\max = \sigma_0^{1} e^{\mu b/n}$.	9
b.	With neat sketches, explain material flow lined in forging.	9
c.	Classify rolling mills, with neat sketch explain planetary rolling mill.	9
	UNIT - III	**18**
3 a.	With neat sketches explain the following; i) Hydrostatic extrusion process ii) Seam less tube extrusion	9
b.	Explain the procedure for determining redundant deformation of drawn wire with a neat sketch.	9

Contd... 2

c. Determine the drawing stress and reduction in area neglecting friction between the rod and the dies. The diameter before and after drawings are 6.25 mm and 5.60 mm respectively and yield stress of rod material is 35 N/mm^2. 9

UNIT - IV **18**

4 a. With neat sketch, explain progressive die and combination die. 9

b. Briefly explain the following with respect to;

i) LDR 9

ii) Forming limit criterion

c. With neat sketches, explain the defects of drawn products. 9

UNIT - V **18**

5 a. Briefly explain the important characteristics of metal powder. 9

b. Explain the different post sintering operations performed on powder metallurgy parts. 9

c. Explain processing of Rubber and elastomers. 9

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