Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3171921 Date:27-11-2024

Subject Name: Metal forming analysis

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Define (1) Notching (2) Nibbling (3) Slitting, for pres work.	**03**
	(b)	State difference between compound and progressive dies.	**04**
	(c)	Give list of methods used for calculation of extrusion load and Explain any one of them in brief with neat sketch.	**07**
Q.2	**(a)**	What do you understand by shear on punch and die?	**03**
	(b)	Discuss various rolling defects.	**04**
	(c)	Discuss stresses developed in deep drawing process with neat sketch.	**07**
		OR	
	(c)	Derive the formula for Rolling Load using Slab Method with usual Notations.	**07**
Q.3	**(a)**	Define angle of bite and discuss its effect in rolling process.	**03**
	(b)	Discuss direct and indirect extrusion with neat sketch.	**04**
	(c)	What do you understand about anisotropy of sheet metal? How do you measure it?	**07**
		OR	
Q.3	**(a)**	What are the benefits of hydrostatics extrusion process?	**03**
	(b)	Briefly explain Forming limit curve with a neat sketch.	**04**
	(c)	Explain various operations performed on sheet-metal press machines.	**07**
Q.4	**(a)**	Discuss on materials used for making wire drawing dies.	**03**
	(b)	Explain in detail Two-Dimensional Mohr's circle method for stress analysis.	**04**
	(c)	Discuss analysis of strip rolling.	**07**
		OR	
Q.4	**(a)**	Why is friction essential in the forging process?	**03**
	(b)	How do you represent strain hardening effect?	**04**
	(c)	Describe Upper bound and Lower bound theorem in metal forming.	**07**
Q.5	**(a)**	Define: (i) Dry drawing (ii) Wet drawing (iii) Tube drawing.	**03**
	(b)	Explain spring back effect in bending process.	**04**
	(c)	State and prove Hencky’s first theorem for Slip Lines with usual notations.	**07**
		OR	
Q.5	**(a)**	Define: (i) Hot forming (ii) Cold forming (iii) Worm forming.	**03**
	(b)	Describe effects of work hardening on mechanical properties of material.	**04**
	(c)	Explain various forging operations with neat sketches.	**07**

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