Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 3171921 Date: 23/06/2023

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.**

			MARKS
Q.1	**(a)**	Define following: 1. Flow stress, 2. Strain Hardening, 3. Strain rate.	**03**
	(b)	Give classification of metal forming processes and its advantages.	**04**
	(c)	Draw and explain typical stress-strain diagram for ductile material.	**07**
Q.2	**(a)**	Differentiate open die forging and closed die forging.	**03**
	(b)	Discuss the different defects in extrusion processes.	**04**
	(c)	Explain Extrusion and Wire Drawing processes in brief.	**07**
		OR	
	(c)	Give list of methods used for calculation of extrusion load and explain any one of them in brief with neat sketch.	**07**
Q.3	**(a)**	Why friction measurement is necessary in forming process?	**03**
	(b)	How is impression die forging different from closed die forging?	**04**
	(c)	Derive the relationship between Yield strength in Shear and Yield strength in Tension according to Tresca's hypothesis of yielding.	**07**
		OR	
Q.3	**(a)**	Differentiate direct and indirect extrusion process.	**03**
	(b)	What are the benefits of hydrostatics extrusion process?	**04**
	(c)	Derive the relationship between Yield strength in Shear and Yield strength in Tension according to Von Mises' hypothesis of yielding.	**07**
Q.4	**(a)**	Define (i) dry drawing (ii) wet drawing (iii) tube drawing.	**03**
	(b)	Discuss on materials used for making wire drawing dies.	**04**
	(c)	Determine engineering strain, true strain & reduction for a) Bar is doubled in Length b) Bar is halved in length.	**07**
		OR	
Q.4	**(a)**	Discuss effect of temperature on yield strength.	**03**
	(b)	Explain various Rolling defects.	**04**
	(c)	Discuss analysis of strip rolling derive equation for projected arc length.	**07**
Q.5	**(a)**	Differentiate blanking and punching operation with sketch.	**03**
	(b)	What is Drawability? List and Discuss factor Affecting to Drawability.	**04**
	(c)	Discuss stresses developed in deep drawing process with neat sketch.	**07**
		OR	
Q.5	**(a)**	Define (1) Notching (2) Nibbling (3) Slitting, for pres work.	**03**
	(b)	Explain spring back effect in bending process.	**04**
	(c)	Explain a) Forming Limit diagram b) Anistrophy in sheet metal.	**07**

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