Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3171921 Date:18/06/2022

Subject Name:Metal forming analysis

Time:02:30 PM TO 05:00 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: (i) Hot forming (ii) Cold forming (iii) Worm forming	**03**
	(b)	Explain forming limit diagram in brief.	**04**
	(c)	Explain in detail Two-Dimensional Mohr's circle method for stress analysis.	**07**
Q.2	**(a)**	Why is friction essential in the forging process?	**03**
	(b)	Describe effects of work hardening on mechanical properties of material	**04**
	(c)	Describe Upper bound and Lower bound theorem in metal forming.	**07**
		OR	
	(c)	State and prove Hencky's first theorem for Slip Lines with usual notations.	**07**
Q.3	**(a)**	Define: (i) Dry drawing (ii) Wet drawing (iii) Tube drawing	**03**
	(b)	What are the benefits of hydrostatic extrusion?	**04**
	(c)	Explain various forging operations with neat sketches.	**07**
		OR	
Q.3	**(a)**	Differentiate direct & indirect extrusion.	**03**
	(b)	Explain wire drawing process in brief.	**04**
	(c)	Derive equation for rate of work done due to deformation for compression of strip.	**07**
Q.4	**(a)**	What is Draw ability? Enlist Factors affecting Draw ability.	**03**
	(b)	Explain various rolling defects.	**04**
	(c)	Derive equation for Rolling load using slab method with usual notations.	**07**
		OR	
Q.4	**(a)**	How is impression die forging different from closed die forging?	**03**
	(b)	Define angle of bite. What is its effect on the rolling process?	**04**
	(c)	Discuss analysis of strip rolling.	**07**
Q.5	**(a)**	What is the difference between punching & blanking operations?	**03**
	(b)	Explain spring back effect in the bending process.	**04**
	(c)	Explain various operations performed on sheet-metal press machines.	**07**
		OR	
Q.5	**(a)**	State difference between compound & progressive die.	**03**
	(b)	Define nesting and explain why it is used in sheet metal operation.	**04**
	(c)	What do you understand about anisotropy of sheet metal? How do you measure it?	**07**

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