GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–II(New course) EXAMINATION(Remedial) –WINTER 2015

Subject Code: 2722801 **Date:09/12/2015**

Subject Name: Mechanics of Metal Forming

Time:2:30 Pm to 5:00 Pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	(a)	Differentiate following related to plastic stress strain relations. (a) Rigid perfectly plastic material. (b) Rigid work hardening material. (c) Elastic perfectly plastic material. (d) Elastic work hardening material.	07
	(b)	Define Incremental Plastic Strain with suitable example along with technical explanation.	07
Q.2	(a)	Explain about importance of Upper bound and Lower bound theorem in forging.	07
	(b)	Define Plane Strain. Show the relationship between α and β slip lines. Define Strain Rate and Super Plasticity.	07
		OR	
	(b)	Explain Bending in Sheet Metal Forming Also show the various stresses in Bending Process.	07
Q.3	(a)	Explain bending theory with various stresses.	07
	(b)	How does Mohr's circle help in analysis of metal forming?	07
		OR	
Q.3	(a)	Prove $P=2K-\sigma x$, By Slab Analysis for Sheet Drawing.	07
	(b)	What do you mean by plastic instability in tension test?	07
Q.4	(a)	Differentiate between local & bulk deformation with at least 5 aspects	07
	(b)	List the CAD/CAM applications in Extrusion, Forging and Sheet metal Forming.	07
		OR	
Q.4	(a)	Explain the concept of constitute relationship. State the general form of a constitutive equation and explain the importance of it.	07
	(b)	What is the important of work hardening? Explain it.	07
Q.5	(a)	Write down the Hancky Equation for variation of hydrostatic pressure. Explain the use of Hancky Equations with example.	07
	(b)	Explain bending in sheet metal forming. Show the various stresses in bending process.	07
		OR	
Q.5	(a)	Derive the relationship between yield strength in shear and yield strength in tension according to Von-Mises hypothesis.	07
	(b)	Explain about Hills anisotropic plasticity theory.	07

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