Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2722806 **Date: 10/12/2015**

Subject Name: Sheet Metal Process

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)**	Explain the types of Sheet Metal Forming processes.	**07**
	(b)	Discuss about different grade available in sheet metal Industries.	**07**
Q.2	**(a)**	Explain the Defect present in Sheet Forming Process with neat sketch.	**07**
	(b)	Explain the Forming Limit Criteria with strain diagram.	**07**
		OR	
	(b)	Describe the mode of Deformation in Sheet Metal Forming.	**07**
Q.3	**(a)**	How to Control and Compensation Springback?	**07**
	(b)	A strip of sheet steel, 2 mm thick and 200 mm wide, is to be bent in a die under conditions of zero friction and zero axial tension. The radius of curvature of the die is 80 mm. The plastic properties of the material are ů = 600Ů$^{0.22}$ MPa. The elastic properties are E = 200 GPa and Poissonôs ratio = 0.3 (a) Find the radius after Springback.	**07**
		OR	
Q.3	**(a)**	Short note on Laser Cutting & Bending of Sheet Metal.	**07**
	(b)	Describe the advantages and disadvantages of Single & Double acting Mechanical Press & hydraulic Press.	**07**
Q.4	**(a)**	Short note on TWB Forming.	**07**
	(b)	Short note on Press Brakes.	**07**
		OR	
Q.4	**(a)**	Explain the Finite Element Modeling in Tube Hydroforming.	**07**
	(b)	A mild steel tube of 180 mm diameter and thickness 4 mm is to be expanded by internal pressure into a square section. The maximum pressure available is 64 MPa. The material has a stress ï strain curve ů = 700(Ů)$^{0.2}$ Mpa. Determine the minimum corner radius that can be achieved if the die is functionless.	**07**
Q.5	**(a)**	In stretching a sheet over a hemispherical Punch, the punch diameter is 100 mm and the initial sheet thickness is 0.9 mm. The tangent point dividing the contact from the non-contact region is at a radius of 28 mm. Grid circles on the sheet initially of 3.5 mm diameter are measured at the tangent point; along the meridional direction the major axis of the deformed circle is 4.4 mm and the minor axis in the hoop direction is 4.1 mm. The material has a stress strain relation of $\sigma = 700(\varepsilon)^{0.2}$ MPa. Determine the Punch Force.	**07**
	(b)	Explain the Stretch Forming Process with neat sketch.	**07**
		OR	
Q.5	**(a)**	Short note on Rapid prototyping for Sheet Metal Forming.	**07**
	(b)	Short note on Superplastic Sheet Forming with Equipment & Tooling.	**07**

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