Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– I (New course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 2712802 **Date:16/05/2015**

Subject Name: Machining Science

Time: 10:30 am to 1:00 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)**	Draw single point cutting tool geometry and explain the effect of each angle on machining performance.	**07**
	(b)	Explain the chip formation theory with neat sketch for single point cutting tool. Also discuss the effect of BUE on machining performance.	**07**
Q.2	**(a)**	Explain the tool chip interface heat generation process. Discuss heat distribution methods and its impact on machining performance.	**07**
	(b)	List different methods to measure tool chip interface temperature and explain any one in detail.	**07**
		OR	
	(b)	Explain working principal & mechanism of Lathe tool dynamometer with neat sketch.	**07**
Q.3	**(a)**	Define the following: (i) Roughness (ii) Waviness (iii) Lay (iv) RMS (v) Sampling length. Explain working principal of Surface roughness meter.	**07**
	(b)	State various modes of tool wear and explain them. Also suggest its prevention.	**07**
		OR	
Q.3	**(a)**	Explain minimum production cost criteria with reference to economics of machining with suitable example.	**07**
	(b)	List the variables affecting tool wear and explain contribution of each variable. Also discuss prevention methods of tool wear.	**07**
Q.4	**(a)**	Derive and expression for shear angle using Lee & Shafferôs relationship.	**07**
	(b)	Explain force relation relationship in oblique cutting.	**07**
		OR	
Q.4	**(a)**	Explain the effect of shear angle on cutting force with suitable example.	**07**
	(b)	Derive the formula for cutting forces using Merchant circle diagram method. List the assumptions made by Merchant to get the various forces.	**07**
Q.5	**(a)**	Explain mechanics of grinding process in detail.	**07**
	(b)	Derive an expression for finding specific energy in grinding.	**07**
		OR	
Q.5	**(a)**	Explain working principal of honing and lapping process. List the industrial application of both the processes.	**07**
	(b)	Explain criteria for selecting grinding wheel. Also list its specifications.	**07**

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