Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

Subject code: 2712802 **Date: 12-01-2015**

Subject Name: Machining Science

Time: 02:30 pm - 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.**

Q.1	**(a)**	What is tool life? Explain the effect of various parameters on tool life.	**07**
	(b)	List various methods to designate the tool geometry and discuss the purpose of conversion from one system to other. Explain any one method of conversion from ASA to ORS.	**07**
Q.2	**(a)**	What is built up edge (BUE)? List the reasons of its formation and explain its effect in metal cutting. (advantage and disadvantages)	**07**
	(b)	List and explain various forms of tool wear in metal cutting, also state its reasons along with its corrective action.	**07**
		OR	
	(b)	List various methods to measure tool life and explain any one.	**07**
Q.3	**(a)**	Derive an expression for finding specific energy in grinding.	**07**
	(b)	List and discuss the parameters to be considered for selecting a grinding wheel specification.	**07**
		OR	
Q.3	**(a)**	List and explain various thermal damage occurs during grinding process.	**07**
	(b)	Compare Grinding, Honning and Lapping process and discuss its selection criteria.	**07**
Q.4	**(a)**	Derive an expression for shear plane angle using Merchant theory.	**07**
	(b)	Explain the role of friction in metal cutting and discuss methods to control it?	**07**
		OR	
Q.4	**(a)**	List various methods to measure tool chip interface temperature and explain tool work thermo-couple method in detail.	**07**
	(b)	Discuss the effect of temperature at tool chip interface for various tool-work material combinations.	**07**
Q.5	**(a)**	List various methods to apply cutting fluids in machining processes and explain the role of cutting fluid with respect to thermal and surface finish aspect.	**07**
	(b)	List various cutting force measurement methods and explain the working principle of lathe tool dynamometer.	**07**
		OR	
Q.5	**(a)**	What is Surface roughness? Why it is important? Discuss various points to be considered for selection of a surface finish for a job?	**07**
	(b)	Discuss economics of machining with respect to maximum production rate criteria.	**07**

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