Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2161504 **Date: 05/05/2017**

Subject Name: Metal Cutting & Advanced manufacturing processes

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

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

			MARKS
Q.1		**Short Questions**	**14**
	1	What is metal cutting?	
	2	Define tool life.	
	3	What is numerical control of machine tools?	
	4	What is a multipoint cutting tool?	
	5	List commonly used cutting fluid.	
	6	Define tool signature.	
	7	What is importance of back rack angle?	
	8	What is purpose of providing nose radius on cutting tool?	
	9	What are important machining variables?	
	10	What do you understand by orthogonal cutting?	
	11	Name advanced cutting tool materials.	
	12	When negative rake angle cutting tool is used?	
	13	State the application of Wire-cut Electro discharge Machining process.	
	14	Name the electrolytes used in ECM process.	
Q.2	**(a)**	Draw the figure of single point cutting tool geometry.	**03**
	(b)	How electro-discharge machining is carried out?	**04**
	(c)	Explain different types of chips formed in metal cutting with conditions.	**07**
		OR	
	(c)	What is machinability? State the factors which come in to play while evaluating machinability of any metal.	**07**
Q.3	**(a)**	Discuss the elements of Computer Numerical Control system.	**03**
	(b)	Which are the main requirements of cutting tool material?	**04**
	(c)	Discuss principles of location for jig and fixture design.	**07**
		OR	
Q.3	**(a)**	State the advantages of CNC system.	**03**
	(b)	What are the essential properties of a cutting fluid?	**04**
	(c)	How will you calculate the work done and power required in metal cutting ?	**07**
Q.4	**(a)**	State the functions of a cutting fluid.	**03**
	(b)	Discuss chip thickness ratio and its importance.	**04**
	(c)	Derive an expression for the optimum cutting speed at which the cost will be minimum.	**07**
		OR	
Q.4	**(a)**	What is chip reduction coefficient?	**03**
	(b)	Discuss the effects of various tool angles on tool wear and tool life.	**04**

	(c)	Explain the construction and use of Merchant's circle diagram.	**07**
Q.5	**(a)**	State the functions of electrolyte in ECM process.	**03**
	(b)	Describe the principle of electro-chemical grinding.	**04**
	(c)	Describe Laser beam machining (LBM) process. State its advantages and disadvantages.	**07**

OR

Q.5	**(a)**	State advantages and disadvantages of explosive forming process.	**03**
	(b)	Describe the principle of abrasive jet machining process.	**04**
	(c)	Discuss plasma arc machining process with its working principle, application, advantages and limitations.	**07**

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