Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 712805N

Subject Name: Design of Machine Tools

Date: 03 /02 /2011 **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)**	Explain working and auxiliary motions in machine tool with example.	**07**
	(b)	What are the various laws for stepped regulation of speeds in multi speed gear box ?	**07**
Q.2	**(a)**	What do you understand by the term Range Ratio ? Explain how is the value of this term decided ?	**07**
	(b)	What is machine tool drive ? Explain mechanical elementary transmission for transforming rotary motion into translatory motion.	**07**
		OR	
	(b)	What is the node method of optimization? Giving examples, use this method in selecting a suitable ray diagram.	**07**
Q.3	**(a)**	Draw the structure diagram and gear box layout for the following structure equations and determine the maximum transmission range for each equation. (i) 2(2) 3(4) 2(1) (ii) 2(3) 3(1) 2(6)	**07**
	(b)	Draw the ray and speed diagram for the nine speed gear box. State the necessary assumptions taken.	**07**
		OR	
Q.3	**(a)**	What do you understand by deviation diagram ? What are the percentage acceptable limits on speed deviation ?	**07**
	(b)	Explain about machine tool testing.	**07**
Q.4	**(a)**	Explain static and dynamic stiffness related to design of machine tool structures.	**07**
	(b)	State the functions and requirements of guideways and classify it.	**07**
		OR	
Q.4	**(a)**	Which design criteria are considered for design of bed in a machine ?	**07**
	(b)	Explain design procedure of slideways for wear resistance.	**07**
Q.5	**(a)**	Which materials are mostly used for spindles ? Explain it.	**07**
	(b)	Differentiate antifriction bearings and sliding bearings.	**07**
		OR	
Q.5	**(a)**	State the general procedure for assessing dynamic stability of EES-cutting process closed loop systems.	**07**
	(b)	Explain about dynamic characteristic of the cutting process.	**07**

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