Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –Ist SEMESTER–EXAMINATION – JULY- 2012

Subject code: 712805N **Date: 11/07/2012**

Subject Name: Design of Machine Tools

Time: 2:30 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)**	Define following term in machine tool drive. (i) cutting speed (ii) feed	**07**
	(b)	Why is Geometric Progression preferred over AP and HP?	**07**
Q.2	**(a)**	What are Ray and Speed Diagrams? How do they differ from Structure Diagrams	**07**
	(b)	Explain about Hydraulic transmission in machine tool drive.	**07**
		OR	
	(b)	Explain the need of using a Multi Speed Gear Box in a Machine Tool Application.	**07**
Q.3	**(a)**	Draw the Structure Diagrams and Gear Box Layout for the following Structure equation and determine the maximum transmission range. (a) 2 (1) 2(2) 3(4)	**07**
	(b)	Draw the Ray and Speed diagram for the Six speed gear box. State the necessary assumptions taken.	**07**
		OR	
Q.3	**(a)**	Explain the term (a) Maximum Loss of Economic Cutting Speed (b) Transmission Range	**07**
	(b)	Explain about machine tool testing.	**07**
Q.4	**(a)**	State the functions and requirements of machine tool structures.	**07**
	(b)	Explain about different protecting devices which used for slideways	**07**
		OR	
Q.4	**(a)**	Explain design procedure for design of column in a machine.	**07**
	(b)	Explain design procedure of Slideways for stiffness.	**07**
Q.5	**(a)**	State the functions and requirements of spindle unit.	**07**
	(b)	Explain about different materials which used for spindle.	**07**
		OR	
Q.5	**(a)**	Explain dynamic characteristics of the equivalent elastic system.	**07**
	(b)	Explain importance of stability analysis in dynamics of machine tools.	**07**

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