Q.P. Code: 13584

[Time: Three Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1.   **Attempt any** FOUR **questions out of SIX questions.**
        2.   **Assume suitable data wherever required.**
        3.   **Illustrate answers with sketches wherever required.**

Answer any four questions

Q1	1. Axial slip of lead screw	**20**
	2. Materials of spindles in Machine tools	
	3. Derive the deflection of spindle axis due to bending	
	4. Explain Testing of spindle axis parallel to bed	
	5. Write short note on gearing diagram	

Q2	**(i)**	List out and explain different acceptance tests of Machine tools.	**10**
	(ii)	Explain Mechanisms involves in stepless regulation of speed and feed rates	**10**

Q3	**(i)**	List out and explain Various laws of Stepped regulation of speed boxes	**10**
	(ii)	How to carryout procedure of Level installation of machine tools with instruments	**10**

Q4	**(i)**	Explain ray chart and speed chart for speed and feed box	**10**
	(ii)	Explain Functions of spindle unit and its requirements	**10**

Q5

Design a two stage 9 Speed gear box a Machine tool from the following

Minimum Speed   150rpm, Maximum Speed 1000rpm, Motor H.P   10hp, Motor Speed =1400rpm

Draw

1. Structural Diagram
2. Optimal Ray diagram   **20**
3. Deviation Diagram
4. Gearing Diagram

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Answerany two questions

   (i)   Parallelism of tailstock guideways with the movement of carriage

Q6   **20**

   (ii)   Derive the effect of machine tool compliance on machining accuracy

   (iii)   Explain various possible structural diagram analysis and selection in speed Box design.