

Duration: 3 hours

Total Marks 80

- Attempt any FOUR questions out of SIX questions.
- Assume suitable data wherever required.
- Illustrate answers with sketches wherever required.

- Q1** Answer any four questions **20**
- 1) Classify speed and feed boxes in machine tool
 - 2) List out and explain different accuracy tests of Machine tools
 - 3) Short note on Materials of spindles in Machine tools
 - 4) Explain Functions of spindle unit and its requirements
 - 5) Explain ray chart and speed chart for speed and feed box
- Q2** (i) Design procedure of sliding friction power screws based on wear resistance, strength, stiffness, buckling stability **10**
 (ii) Derive optimum spacing between spindle supports **10**
- Q3** (i) Derive the deflection of spindle axis due to compliance of spindle supports **10**
 (ii) How to carryout procedure of Level installation of machine tools with instruments
- Q4** (i) Explain structural diagram and their analysis to select the possible version **10**
 (ii) Testing of spindle axis parallel to bed. **10**
- Q5** (i) List out and explain Various laws of Stepped regulation of speed boxes **10**
 (ii) The lead screw of a lathe has single start ISO Metric threads of 52mm nominal diameter and 8mm pitch. The screw is required to exert an axial pulling load of 4KN in order to drive the tool carriage during turning operation **10**
- Q6** Answer any two questions **20**
- (i) Parallelism of tailstock guideways with the movement of carriage.
 - (ii) Explain Mechanisms involves in stepless regulation of speed and feed rates.
 - (iii) Explain gearing diagram and their analysis to select the possible version

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