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Machine Tool Design
(1100 / 1102)

P. Pages : 2

Time : Three Hours **Max. Marks :100**

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any five** questions.
5. Neat diagrams must be drawn wherever necessary.
6. Figures to the right indicate full marks.
7. Assume suitable data, if necessary.

1. a) Explain with sketches the design specification and working principles used in machine tool design. **10**

b) Explain various drives used in machine tools with its advantages and limitations. **10**

2. a) Explain in brief. **10**
i) Structural diagram.
ii) Ray diagram.
iii) Speed chart with diagram.

b) Describe in brief the stepless regulation of speed and feed rates. **10**

3. a) What do you mean static and dynamic stiffness in case of design of machine tool structures ? **10**

b) Describe the procedure for design of beds for lathe machine. **10**

4. a) Explain in brief the design criteria and calculation for slide ways with neat sketches. **10**

b) Explain the procedure of design of antifriction guide ways in detail. **10**

5. a) i) Differentiate between capstan and turret lathes. **5**

ii) Describe half nut mechanism for engaging lead screw. **5**

b) Define the following terms related with power screw of machine tools. **10**

i) Efficiency of the screw.

ii) Maximum static load.

iii) Strength of lead screw.

iv) Backlash of sliding screw.

6 a) Explain the procedure for design of columns of machine tool. **10**

b) State and explain the causes the chatter in lathe operation. Suggest suitable remedial measures for reducing chatter. **10**

7. a) Give the difference between NC, CNC and DNC machines. **10**

b) Explain various methods of increasing rigidity of machine tool. **10**

8. Write short note on following. **20**

i) Automatic tool changer.

ii) Transmission in stepped regulation.

iii) Manual part programming.

iv) Computer Aided part programming.

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