

Roll No: .....

Total No. of Questions : 09]

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## Paper ID [A0233]

(Please fill this Paper ID in OMR Sheet)

**B. Tech. (Sem. - 7<sup>th</sup>/8<sup>th</sup>)**

**MACHINE TOOL DESIGN (PE - 406)**

**Time : 03 Hours**

**Maximum Marks : 60**

**Instruction to Candidates:**

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

### Section - A

**Q1)** **(10 × 2 = 20)**

- a) Draw the commonly used slide-way profiles.
- b) What are the main elements of a machine tool drive?
- c) How a milling machine is specified?
- d) Define speed and feed regarding lathe operations.
- e) Name the main elements of a shaper.
- f) What is the chief advantage of using hydraulic drive in machine tools?
- g) What is meant by machine tool testing?
- h) What is the purpose of feed motion in machine tools?
- i) What do you mean by machine tool elastic system?
- j) Name the materials used for making spindles.

## Section - B

(4 × 5 = 20)

- Q2) What are the advantages of a step-less drive? Describe any one commonly used mechanical step-less drive in machine tools.
- Q3) What are feed control devices? Why are they needed? Explain the feed control by using limit switches.
- Q4) Define backlash and what are its after effects? How is backlash minimized in a lead screw and nut drive?
- Q5) What is the importance of guide-ways in machine tools? Describe the main types of slide- ways used machine tools.
- Q6) Explain the design considerations of a spindle to be used in a lathe.

## Section - C

(2 × 10 = 20)

- Q7) Discuss the design considerations of machine tool structures. What methods are used for improving rigidity?
- Q8) Briefly explain the mechanical and electrical automatic control systems used in machine tools.
- Q9) Write notes on:
- Dynamic characteristics of the cutting forces.
  - Feed mechanism used in milling machine.