

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2548

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION 2010-11
PRINCIPLES OF MACHINE TOOL DESIGN

Time : 3 Hours

Total Marks 100

- Note :** (1) Attempt **all** questions.
(2) Marks allotted to each question are indicated on right hand side.

- I. Attempt any **four** parts of the following : **(4×5=20)**
- What do you understand by Tool Wear ? What are Crater Wear and Flank Wear ? Explain
 - What are tool dynamometers ? Explain the working of any dynamometer giving its important characteristics.
 - Write a detailed note on the history and development of machine tools.
 - 'Lathe is the Queen of all machine tools'—justify the statement giving suitable reasons.
 - Discuss the 'Basic Elements' of a machine tool.

(f) Write notes on :

- (i) Machine tool beds
- (ii) Slides and guide ways.

2. Attempt any **two** parts of the following : (2×10=20)

- (a) How machine tool drives are classified? Compare Group drive with individual drive. Also explain the process of selection of electric motor for such drives.
- (b) Discuss various types of Quick Return mechanisms giving their applications and advantages.
- (c) List various elements of hydraulic transmission system. Explain their working. Compare its advantages and disadvantages with other transmission Systems.

3. Attempt any **two** parts of the following : (2×10=20)

- (a) What do you understand by 'speed regulation'? Why it is needed? What are stepped and stepless regulations?
- (b) What are Structure Diagrams or Ray Diagrams? How is a 'Structure Diagram, constructed'?
- (c) Write a note on Design of Feed Box.

4. Attempt any **two** parts of the following : (2×10=20)

- (a) What are the Common forces considered while designing machine beds? What main characteristics should the machine bed possess? Discuss.

(b) What materials are commonly used for the machine tool spindles? What main characteristics a spindle should possess?

(c) List the factors governing the selection of bearings for machine tools. Classify the bearings used in machine tools. When would you prefer the use of Sliding Friction bearings?

5. Attempt any **two** parts of the following : (2×10=20)

- (a) What do you understand by 'Chatter' in machine tools? How it affects the product quality? How it can be removed? Explain.
- (b) What do you understand by Numerical Control of Machine Tools? Explain. Compare its advantages over conventional machining processes.
- (c) Explain in detail various steps involved in testing of Machine Tools.