

FACULTY OF ENGINEERING

B.E. 4/4 (Mech/ Prod.) II-Semester (Main) Examination, May / June 2012

**Subject : Machine Tool Design
(Elective-II)**

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.**PART – A (25 Marks)**

1. What are the advantages of Ball screws?
2. What are the advantages of transfer machines?
3. What is productivity loss and how can it be reduced?
4. What are the advantages and limitations of pneumatic drives?
5. Sketch various stepless drives used in practice.
6. What are the advantages of V-guide ways over flat guide ways?
7. How the rigidity of columns be improved?
8. Sketch the spindle arrangement for drilling m/e.
9. Sketch the working mechanism of reciprocating pump.
10. What is the importance of relief valve?

PART – B (5x10=50 Marks)

- 11.(a) What are the various mechanisms used to convert rotary motion of linear motion?
(b) Sketch and explain the construction and working of ratchet and pawl mechanism used for intermittent motion.
- 12.(a) Draw the Kinematic structures of rotary transfer machine and mention its advantages.
(b) How the highest, lowest speeds for a machine pool are selected and explain the importance of range ratio?
- 13.(a) How the optimum speed chart is drawn for 12 speed gear box?
(b) Describe the design procedure in selecting gears and shafts.
- 14.(a) Differentiate between sliding cluster drives and clutched drives.
(b) Sketch and explain the construction and working of Meander drives used in feeds.
- 15.(a) What are the shapes used for machine tool structures and mention their relative advantages?
(b) What are the various methods adopted in adjusting the clearances in guide ways?
- 16.(a) How the spindle for milling machine is designed and sketch the arrangement?
(b) Differentiate between Hydrostatic and Aerostatic bearings.
17. Answer the following :
 - (a) Pneumatic controls
 - (b) Gear pumps
 - (c) Hydraulic power pack