

B.TECH SEM – VII (2007 COURSE) (PRODUCTION ENGG.) :
WINTER - 2017

SUBJECT : MACHINE TOOL DESIGN

Day : **Friday**
Date : **12/01/2018**

W-2017-2614

Time : **02.30 PM TO 05.30 PM**
Max. Marks : **80**

N.B.:

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** of the each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Assume suitable data if necessary.

SECTION – I

- Q.1** Design an 8 speed gearbox with speeds ranging upto 900rpm. Given that $\phi = 1.26$. [14]
Draw:
- a) Structural diagram
 - b) Best ray diagram
 - c) Layout sketch of gearbox
 - d) Deviation diagram
- Q.2** a) Compare metering in and metering out circuits used in machine tool control systems. [07]
- b) What are the general requirements of machine tool design? [06]
- Q.3** a) Compare merits and demerits of arithmetic progression and geometric progression in design of gear boxes used in machine tools. [07]
- b) Explain the Ward-Leonard system of electrical stepless regulation of speed. [06]
- Q.4** a) On the basis of optimum design criteria, compare cast iron and steel as used in machine tool structures. [07]
- b) Compare various methods of strengthening the columns used in machine tool structures. [06]

SECTION – II

- Q.5** Compare Swiss type and single spindle automats. Explain with neat sketches the methods of actuations of slides in single spindle automat. [14]
- Q.6** a) Justify 'In design of slideways the average pressure acting on the slideways is the most dominating factor'. [07]
- b) What are the different methods used for clearance adjustment in power screws? [06]
- Q.7** a) Discuss the importance of compliance in design of machine tool spindles. [07]
- b) Sketch the typical spindle ends. Justify its geometry for particular application. [06]
- Q.8** a) Why the modular concept of machine tool design is not being successfully implemented? [07]
- b) Compare transfer lines with FMS. [06]

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