

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VIII EXAMINATION – WINTER 2015**

**Subject Code:181908****Date:12/12/2015****Subject Name: Machine Tool Design****Time: 2:30pm to 5:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss the general requirements of machine tool. **07**  
 (b) State and explain the basic design aspects used in machine tool design. **07**
- Q.2** (a) Explain the different types of progressions used to decide the standard speeds. **07**  
 Which one is most widely used? Why?  
 (b) Explain the rules and step by step design procedure of speed gearbox. **07**
- OR**
- (b) Design an eight speeds sliding gearbox for a drill press from the following data **07**  
 Minimum speed 80RPM , maximum speed 900RPM, motor power = 7.5KW at  
 1440 RPM , reduction through V belt drive between motor and input shaft = 1:2  
 Draw the structural diagram and speed chart.
- Q.3** (a) Explain the design of machine tool slideways in detail. **07**  
 (b) Differentiate clearly between stepped drives and stepless drives. Explain any one of the stepless drives. **07**
- OR**
- Q.3** (a) Explain the design of machine tool spindles based on strength and stiffness. **07**  
 (b) Write a detailed note on hydrostatically lubricated slideways with a neat sketch. **07**
- Q.4** (a) Explain the design of machine tool structures in detail. **07**  
 (b) Explain the drive for producing rotational movements. **07**
- OR**
- Q.4** (a) What are the advantages offered by hydraulic regulation in machine tools? Explain hydraulic drive for producing rectilinear movements. **07**  
 (b) Explain the structural elements design for centre lathe / drilling machine. **07**
- Q.5** (a) Explain the forces, torque and power requirements milling. **07**  
 (b) List various automatic machines and explain the working of automatic cutting off machine. **07**
- OR**
- Q.5** (a) Explain the forces, torque and power requirements drilling. **07**  
 (b) Discuss the importance of automatic control in machine tools. Discuss the automatic clamping and unclamping the work piece. **07**
- OR**

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