Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:X81905 **Date:04/12/2015**

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)**	Design an eight speeds sliding gearbox for a drill press from the following data: Minimum speed = 70 RPM Motor speed = 1440 RPM Maximum speed = 1800 RPM Speed of input shaft = 900 RPM Draw only the structural diagram and speed chart.	**07**
	(b)	State the rules and discuss the design procedure of speed gearbox.	**07**
Q.2	**(a)**	Discuss the general requirements of machine tools.	**07**
	(b)	State and explain the basic design aspects used in machine tool design.	**07**
		OR	
	(b)	Why the geometrical progression is most widely used to decide the standard speeds for machine tools? Also state other types of progressions used for this and explain any two of them.	**07**
Q.3	**(a)**	Explain the structural elements design for centre lathe / drilling machine.	**07**
	(b)	What are the advantages offered by hydraulic regulation in machine tools? Explain hydraulic drive for producing rectilinear movements**.**	**07**
		OR	
Q.3	**(a)**	Explain the design of machine tool spindles based on strength and stiffness.	**07**
	(b)	Explain the drive for producing rotational movements.	**07**
Q.4	**(a)**	Explain the hydrostatically lubricated slideways (working, advantages and limitations, design) with a neat sketch.	**07**
	(b)	Explain the design of machine tool structures based on rigidity and strength in detail.	**07**
		OR	
Q.4	**(a)**	Differentiate clearly between stepped drives and stepless drives. Explain any one of the stepless drives.	**07**
	(b)	Explain the design of machine tool slideways in detail.	**07**
Q.5	**(a)**	Why the automatic controls are used in machine tools? Discuss the automatic control of movements for starting, stopping and reversing.	**07**
	(b)	Explain the forces, torque and power requirements turning.	**07**
		OR	
Q.5	**(a)**	Explain the forces, torque and power requirements drilling.	**07**
	(b)	List various automatic machines and explain the working of automatic cutting off machine.	**07**

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