Seat No.: _____ Enrolment No._____

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. Which one is most widely used? Why?	**07**
	(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 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.	**07**
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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