	GUJARAT TECHNOLOGICAL UNIVERSITY		
		M. E SEMESTER – II • EXAMINATION – SUMMER • 2014	
		bject code: 1720805 Date: 20-06-2014	
	Tir	bject Name: Machine Tool Design ne: 02:30 pm - 05:00 pm Total Marks: 70 structions:	
	1115	1. Attempt all questions.	
		2. Make suitable assumptions wherever necessary.	
		3. Figures to the right indicate full marks.	
		4. Use of PSG Design Data Book is permitted in examination.	
Q.1	(a) (b)	Discuss the general design requirements to be satisfied for any machine tools. Write a note on Selection of electric motors and its power calculation/estimation for machine tools.	07 07
Q.2	(a) (b)	Explain the design of column based on strength and rigidity in brief. State the design requirements to be considered in machine tool gearbox design. Explain the design steps of gearbox.	07 07
		OR	
	(b)	Design (draw only structure diagram and speed chart only) a radial drilling machine gearbox from the following data: $N_{min} = 70 \text{ r.p.m.} \qquad \qquad \text{Speed of gearbox input shaft} = 900 \text{ r.p.m.} \\ N_{max} = 1800 \text{ r.p.m.} \qquad \qquad \text{No of steps} = 8$	07
Q.3	(a)	Explain the about the optimum spacing between the spindle supports in lathe machine.	07
	(b)	Explain the various profiles of slide ways in detail with neat sketches. OR	07
Q.3	(a) (b)	Explain the basic design aspects used for machine tool spindle design. Explain the hydrostatic slide ways with neat sketch.	07 07
Q.4	(a)	Explain the commonly used column sections and their applications with neat sketches.	07
	(b)	Explain the dynamic characteristics of machine tools. OR	07
Q.4	(a) (b)	Explain the basic design aspects used for machine tool column design. Explain the construction of antifriction guide ways.	07 07
Q.5	(a) (b)	Explain the design aspects of modern CNC machine tools. Explain servomotors used in CNC machine tools. OR	07 07
Q.5	(a)	State the CAD software packages used for machine tools design. Explain the sailent features of any one of them.	07
	(b)	Explain the construction and working of ball circulating power screw.	07

Enrolment No. _____

Seat No.: _____
