FirstRanker.com
Firstranker's choice
Seat No.: _____ www.FirstRanker.com Enrolment No. www.FirstRanker.com

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (OLD) EXAMINATION – WINTER 2018

Subject Code: 182503 **Date: 19/11/2018**

Subject Name: Design Of Product And Machine Tools

Time: 02:30 PM TO 05:00 PM **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 general requirements of machine tool design.	**07**
	(b)	Explain various Elementary transmission methods for Transforming rotary motion into Translatory.	**07**
Q.2	**(a)**	With neat sketch explain following gear box: (1) Feed box with tumbler gear (2) Feed box with change gear	**07**
	(b)	State the functions and requirements of the spindle unit along with the materials.	**07**
		OR	
	(b)	Discuss various types of Bed structure and wall arrangements and their applications with neat sketch.	**07**
Q.3	**(a)**	Design hydrodynamic journal bearing for a shaft of blower for following data: Bearing Load due to belt force: 3000N, Bearing Load due to weight of rotor: 600N, Speed of Blower: 600 rpm, diameter of shaft: 50 mm, Expected temperature of oil:70°, ambient temperature: 30°, c/d ratio - 0.0015, Minimum film thickness: 0.019 mm Calculate: actual attitude, type of oil used, power loss, heat generated, actual minimum film thickness.	**07**
	(b)	State advantages and Disadvantages of hydrodynamic and hydrostatic bearings. Discuss where each one is more suitable.	**07**
		OR	
Q.3	**(a)**	Design hydrodynamic journal bearing for lathe spindle from following data: Load on spindle: 20kN, Speed of Spindle: 2000 rpm, diameter of spindle at journal: 100 mm, l/d = 2, Clearance ratio: $2*10^{-3}$, viscosity of oil at working temperature = $35*10^{-3}$kg/m.s Calculate: bearing characteristic number.	**07**
	(b)	Explain the importance of lubrication of ball and roller bearing. Illustrate few methods of carrying out proper lubrication for specific application.	**07**
Q.4	**(a)**	Explain the design procedure of Slideways for wear resistance.	**07**
	(b)	Give requirement of Protecting devices for slide ways and explain various types of protecting devices with neat sketch.	**07**
		OR	
Q.4	**(a)**	Discuss various shapes of slide ways and justify their application for machine tools.	**07**
	(b)	Find the diameter of rope required for an overhead travelling crane with lifting magnet. Take, Lifting capacity: 5000 kg, Weight lifting magnet = 2000 kg, weight lifting tackle = 120 kg, Lifting height = 8 meters, No of Rope parts = 4Take Dmin/d = 23, d_w=0.045, E_r=$8*10^4$ N/mm^2, σ_u= 1500 N/mm^2	**07**

www.FirstRanker.com

FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

Q.5	**(a)**	Design the crane hook for the lifting capacity of 8 tonnes, having triangular section. Take permissible tensile stress 110 N/mm^2 for forged steel.	**07**
	(b)	Discuss the economic criteria that are important in Evaluative product design.	**07**

OR

Q.5	**(a)**	Explain Computer assisted design and Robotics in Product design.	**07**
	(b)	Discuss the importance of CAD in developing the products.	**07**

****

www.FirstRanker.com

www.FirstRanker.com