

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (OLD) EXAMINATION – SUMMER 2019****Subject Code: 182503****Date: 13/05/2019****Subject Name: Design of Product And Machine Tools****Time: 10:30 AM TO 01:00 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) Explain various Elementary transmission methods for Transforming rotary motion into Translatory. **07**
(b) Explain various devices for Intermittent motion. **07**
- Q.2** (a) Explain the general requirements for Machine tool design. **07**
(b) With neat sketch explain following gear box: **07**
(1) Norton's gear (2) Feed box with gear cone & sliding key
- OR**
- (b) Design hydrodynamic journal bearing for a shaft of blower for following data: **07**
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.
- Q.3** (a) Discuss various types of Bed structure and wall arrangements and their applications with neat sketch. **07**
(b) Explain the design procedure of Slideways for wear resistance. **07**
- OR**
- Q.3** (a) Explain various Slideways profile with neat sketch and application. **07**
(b) Explain various methods to adjust the clearance in slide ways? **07**
- Q.4** (a) Write a note on Antifriction Guideways. Explain Open type and Close type antifriction guideways. **07**
(b) Explain: Preloading of Antifriction bearing. **07**
- OR**
- Q.4** (a) State advantage and disadvantage of Hydrodynamic and Hydrostatic bearing. Discuss where each one is more suitable. **07**
(b) Design crane hook for lifting capacity of 12 tonnes, having triangular section. Take permissible tensile stress as 130 N/mm² for forged steel. **07**
- Q.5** (a) Enlist and explain any seven factors to be considered for preparing product design specification for Fully Automatic dish washer. **07**
(b) Design a self-aligning ball bearing for a radial load of 7000 N and a thrust load of 2100 N. The desired life of the bearing is 160 millions of revolutions at 300 r.p.m. Assume uniform and steady load. **07**
- OR**
- Q.5** (a) Discuss various factors to be considered for prepare a product design specifications. **07**
(b) Give classification of steel wire ropes. How numbers of band are determined for steel wire ropes while designing material handling systems? **07**
