

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV(OLD) – EXAMINATION – SUMMER 2019****Subject Code:142001****Date:17/05/2019****Subject Name: Kinematics And Dynamics Of Machines****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) Explain different types of kinematic pairs with suitable examples. **07**
(b) Explain different types of gear trains with suitable sketches. **07**
- Q.2** (a) Explain different types of followers with neat sketches. **07**
(b) What is velocity of rubbing? Explain it for a four bar chain mechanism. **07**
- OR**
- (b) Explain different types of vibration with suitable sketches. **07**
- Q.3** (a) Explain different types of pulleys with neat sketches. **07**
(b) Sketch & explain various inversions of four bar chain mechanism. **07**
- OR**
- Q.3** (a) Derive a relation for minimum number of teeth on gear wheel and the pinion to avoid interference. **07**
(b) By using Klein's construction method, explain the procedure to determine velocity and acceleration of a slider crank mechanism. **07**
- Q.4** (a) Explain different types of cams with neat sketches. **07**
(b) Explain the effect of gyroscopic couple on Naval ship during steering, pitching and rolling. **07**
- OR**
- Q.4** (a) Explain working of pantograph mechanism with suitable diagram. **07**
(b) Draw displacement, velocity and acceleration diagram for SHM and constant velocity motion of the follower. **07**
- Q.5** (a) Explain static balancing and dynamic balancing. **07**
(b) Derive the relation, $T_1/T_2 = e^{\mu\theta}$ for a flat belt drive. **07**
- OR**
- Q.5** (a) Draw the profile of a cam operating a knife-edge follower having a lift of 30 mm. The cam raises the follower with SHM for 1500 of the rotation followed by a period of dwell for 600 .The follower descends for the next 1000 rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at a uniform velocity of 120 rpm and has a least radius of 20 mm. **07**
(b) Derive expressions for the exact and approximate lengths of belt in an open belt drive. **07**
