

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-IV(OLD) – EXAMINATION – SUMMER 2019**

**Subject Code:141902**

**Date:20/05/2019**

**Subject Name: Kinematics 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)** Enlist different straight line mechanisms? Describe one type of exact straight line motion mechanism with the help of a sketch. **07**
- (b)** Define the following terms.(1)Link(2)Higher pair(3)Ternary Joint(4)Locked chain(5)constrained Motion(6)Degree of freedom(7)Quaternary link. **07**
- Q.2 (a)** Sketch and show the Davis steering mechanism and discuss their advantages and disadvantages. **07**
- (b)** Sketch and explain any two inversions of double slider crank chain **07**
- OR**
- (b)** Explain Types of Instantaneous Centres and also state Kennedy Theorem **07**
- Q.3 (a)** A cam is to be designed for a knife edge follower with the following data: **07**
1. Cam lift = 40mm during 90° of cam rotation with simple harmonic motion. 2. Dwell for the next 30°. 3. During the next 60° of cam rotation, the follower returns to its original position with uniform velocity. 4. Dwell during the remaining 180°. Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40mm.
- (b)** Explain with sketches the different types of cams and followers. **07**
- OR**
- Q.3 (a)** Describe the construction and working of a centrifugal clutch. **07**
- (b)** Define the following terms as applied to cam with a neat sketch :- **07**
- (a) Base circle, (b) Pitch circle, (c) Pressure angle, and (d) Stroke of the Follower
- Q.4 (a)** Explain any six terminology of gear tooth with neat sketch. **07**
- (b)** Derive an expression for the length of the path of contact in a pair of meshed spur gears. **07**
- OR**
- Q.4 (a)** Differentiate between Involute and Cycloidal profile of gear tooth. **07**
- (b)** Explain briefly the differences between simple, compound, and epicyclic gear trains. What are the special advantages of epicyclic gear trains ? **07**
- Q.5 (a)** Explain the working of Multi-plate clutch with neat sketch. **07**
- (b)** Describe Klein's construction with an example. **07**
- OR**
- Q.5 (a)** State the criteria of selection of following for transmission of power: 1. Belt Drive 2. Rope Drive 3. Chain Drive 4. Gear Drive **07**
- (b)** What is undercutting in gears. Explain the interference in involute gears. How interference can be prevented? **07**

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