Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER II– • EXAMINATION –WINTER- 2016

Subject Code: X21902 **Date:03/01/2017**

Subject Name: KINEMATICS OF MACHINES

Time:02:30 PM to 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Describe the classification of Links & Kinematic Pairs in detail. **07**

(b) Construct the profile of a cam to give the following motion to the reciprocating follower with a roller follower : **07**

(i) Follower to have a stroke of 20 mm during 120° of cam rotation with uniform velocity;

(ii) Follower to dwell for 30° of cam rotation ;

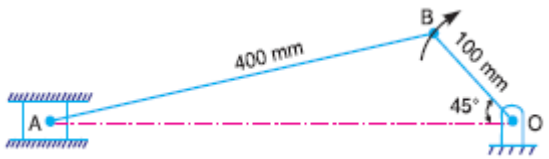
(iii) Follower to return to its initial position during 120° of cam rotation with SHM;

(iv) Follower to dwell for remaining 90° of cam rotation.

The minimum radius of the cam is 25 mm.

Q.2 **(a)** Locate all the instantaneous centers of the slider crank mechanism as shown in Fig. If the crank rotates clockwise with an angular velocity of 10 rad/s, find : **07**

1. Velocity of the slider A, and 2. Angular velocity of the connecting rod AB.



(b) Explain with neat sketch different types of Cams? What are the different types of Followers used in cams? **07**

Q.3 **(a)** Write a note on Types of Frictions. **07**

(b) Explain Klein's Construction method with neat sketch. **07**

Q.4 **(a)** Explain Uniform Pressure Theory in Cone Clutch with neat sketch. **07**

(b) Sketch and explain the various Inversions of a Slider crank chain. **07**

Q.5 **(a)** Compare Cycloidal and Involute tooth gears. **07**

(b) Write a note on types of Mechanisms. **07**

Q.6 **(a)** Write a note on various types of Gears. **07**

(b) Derive the expression for Limiting tension ratio in case of Flat belt drive. **07**

Q.7 **(a)** Derive an expression for Length of Cross belt drive. **07**

(b) Explain the following terms : **07**

a) Friction b) Limiting force of friction

c) Angle of friction d) Co efficient of friction

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