

Roll No. \_\_\_\_\_

**3210**

**B. Tech. (ME) 5th Semester  
Examination – February, 2022**

**KINEMATICS OF MACHINE**

**Paper: PCC-ME-307-G**

**Time : Three hours ]**

**[ Maximum Marks : 75**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each limit. Question No. 1 is compulsory.

**1.** Write about :

**2.5 = 6 = 15**

- (a) Kinematic pair.
- (b) Kinematic chain.
- (c) Disadvantages of gear drive.
- (d) What is cam profile?
- (e) Application of gear trains.
- (f) Creep.

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**UNIT - I**

2. What are straight line mechanisms ? Describe two types of exact straight line motion mechanism with the help of a sketch. 15
3. Discuss about : 15
- (a) Instantaneous centre of velocity. 8
  - (b) Rubbing velocity at a pin-joint. 7

**UNIT - II**

4. A cam drives a flat reciprocating follower in the following manner : During first  $120^\circ$  rotation of cam follower moves outwards through a distance of 20 mm with S. H. M. The follower dwell during next  $30^\circ$  of cam rotation. During next  $120^\circ$  of cam rotation, the follower moves inwards with S. H. M. The follower dwells for next  $90^\circ$  of cam rotation. The minimum radius of cam is 25 mm. Draw the profile of cam. 15
5. A pair of involute gear with 14 and 21 teeth have pressure angle  $16^\circ$ . Find maximum addenda on pinion and gear to avoid interference if module is 6 mm. Also find the length of path of contact and contact ratio. 15

**UNIT - III**

6. In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 rpm. in the anticlockwise direction about the centre of gear A which is fixed, determine

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speed of gear B. If the gear A instead of being fixed, makes 300 rpm. in the clockwise direction, what will be speed of gear B ? 15

7. Write about :

- (a) Kinematic synthesis of Mechanism 8
- (b) Chebyshev spacing 7

**UNIT - IV**

8. Write about :

- (a) Laws of Friction 8
- (b) Friction in journal bearing 7

9. State and explain law of belting. Also find out the length of open belt and cross belt drive. 15

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