

Code: ME4T4, AE4T4

II B.Tech - II Semester – Regular Examinations – May 2016

KINEMATICS OF MACHINERY

(Common for ME, AE)

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1. a) In what way a mechanism is different from a machine?
- b) Name any two straight line motion mechanisms.
- c) What do you understand by ‘gear train’? What is its use?
- d) Mention any two advantages of Cycloidal gears.
- e) What is pantograph?
- f) What is Grubler’s criterion?
- g) Define coriolis component of acceleration
- h) List out different types of kinematic pairs.
- i) What are applications of reverted gear train?
- j) What is pressure angle of a cam follower mechanism?
- k) What are different types of followers for cam mechanism?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. What is an inversion of mechanism? Explain the inversions of slider crank mechanism with neat sketches. 16M

3. In a four link mechanism, the crank AB rotates at 36 rad/s. the lengths of the links are AB=200mm, BC=400mm, CD=450mm and AD=600mm. AD is fixed link. At the instant when AB at right angles to AD, determine the velocity of (i) the mid-point of link BC (ii) a point on the link CD, 100mm from the pin connecting the links CD and AD. 16 M
4. a) Sketch a paucellier mechanism. Show that it can be used to trace a straight line? 6 M
- b) What is the fundamental equation correct gearing? Explain the Davis steering gear mechanism? 10 M
5. A cam drives a flat reciprocating follower in the following manner:
During first 120° rotation of the cam, follower moves outwards through a distance of 20mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25mm. Draw the profile of the cam. 16 M
6. a) Derive an expression for the length of arc of contact in a pair of meshed spur gears. 6 M

- b) An epicyclic train of gears is arranged as shown in Fig. How many revolutions does the arm, to which the pinions B and C are attached, make: (i) when A makes one revolution clockwise and D makes half a revolution anticlockwise and (ii) When A makes one revolution clockwise and D is stationary? The number of teeth on the gears A and D are 40 and 90 respectively. 10 M

