

Roll No.

OLE-3210
B. Tech. 5th Semester (ME)
Examination – April, 2021

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 any *five* questions in all. Question No. 1 is *compulsory* and attempt any *one* question from each section. All questions carry equal marks.

1. Explain : **5 × 3 = 15**

- (a) Kinematic links and its types
- (b) Difference between involute and cycloidal tooth profile
- (c) Difference between spur and helical gears.

SECTION – A

2. (a) Explain the inversions of four bar chains. 8
(b) Explain the working of Pantograph. 7
3. Explain different types of kinematic pairs with sketches. 15

SECTION – B

4. A cam is to give the following motion to a knife-edged follower :
 - (a) Outstroke during 60° of cam rotation
 - (b) Dwell for the next 30° of cam rotation
 - (c) Return stroke during next 60° of cam rotation, and
 - (d) Dwell for the remaining 210° of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower is offset by 20 mm from the axis of the cam shaft. 15

5. Explain the Law of Gearing with the help of neat sketch. 15

SECTION – C

6. In a reverted epicyclic gear train, the arm A carries two gears B and C and a compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 75, 30 and 90 respectively. Find the speed and direction of gear C when gear B is fixed and the arm A makes 100 r. p. m. clockwise. 15
7. Derive an expression for Freudenstein's Equation for 4 bar mechanism. 15

SECTION – D

8. Derive an expression for minimum force required to drag a body on a rough surface. 15
9. Find the length of the cross belt and power transmitted by a belt. 15
