UNIT – IV

8. Write about :

   (a) Types of Friction 8

   (b) Friction circle. 7

9. Write about :

   (a) Material for belts 8

   (b) Chain drives. 7

Roll No. .....

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B. Tech. 5th Semester (ME) Examination – March, 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 ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All question carry equal marks.

1. Write about : $2.5 \times 6 = 15$

   (a) Kinematic link.

   (b) Kinematic inversion.

   (c) Advantages of gear drive.

   (d) Cam

(e) Gear train.

(f) Law of Friction.

UNIT – I

2. Explain Pantograph in detail with its diagram of original position and displaced position. Also mention the uses of photograph. 15

3. State and prove Kennedy's theorem. How is it useful in locating various instantaneous centres of a mechanism ? 15

UNIT – II

4. Draw the profile for disc cam off set 20 mm to the right of the centre of cam shaft. The base circle diameter is 75 mm and diameter of roller is 10 mm. The follower is to move outward a distance of 40 mm with S.H.M in 140° of cam rotation to dwell for 40° of cam rotation to move inward with 150° of cam rotation with uniform acceleration and retardation. Calculate the maximum

velocity and acceleration of the follower during each stroke if can shaft rotates at 90 rpm. 15

5. Two 20° involute spur gears have a module of 10 mm. The addendum is one module. The larger gear has 50 teeth and the pinion 13 teeth. Does the interference occur ? If it occurs, to what value should the pressure angle be changed to eliminate interference ? 15

UNIT – III

6. In an epicyclic gear train an annular wheel A hving 54 teeth meshes with a planet wheel B which gears with a sun wheel C, the wheel A and C being coaxial. The wheel B is carried on a pin fixed on one end of arm P which rotates about axis of wheels A and C. If wheel A makes 20 r.p.m. in clockwise sense and arm rotates at 100 r.p.m. in anticlockwise direction and the wheel C has 24 teeth. Determine r.p.m. and sense of rotation of C. 15

7. Derive Freudenstein's equation. 15