

May 2023

B.Tech.- IV SEMESTER

Kinematics of Machine (PCC-ME-206)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) What is Spherical pair? (1.5)
- (b) What are applications of cam and followers? (1.5)
- (c) What is difference between machine and mechanism. (1.5)
- (d) Why, Relative velocity method is more useful. (1.5)
- (e) Differentiate between base circle and prime circle of cam. (1.5)
- (f) Which materials are used in shoe of brakes? (1.5)
- (g) What is difference between brakes and dynamometers? (1.5)
- (h) What is Gear train? (1.5)
- (i) What is number synthesis? (1.5)
- (j) What do you mean by synthesis of mechanism? (1.5)

PART -B

- Q2 (a) What are different types of followers? Classify them. (10)
- (b) What is the condition for self-locking of brake and self-energised brake. (5)
- Q3 In four bar mechanism ABCD, points A and C are fixed points 30 cm apart and AB, CD are bars 60 cm and 70 cm long respectively, which are connected by a rod BD which is 50 cm long. If AB rotates with uniform speed of 60 rpm, determine: (i) velocity of D when AB is perpendicular to AC and also when it makes 10 degree on either side of perpendicular, and (ii) the instantaneous centre of the bar BD and its angular velocities in the three positions. [15]
- Q4 What do you mean by inversion of mechanism? Explain with sketches all the inversions of single slider crank mechanism. Where these inversions are used? (15)
- Q5 Find an expression for tangential acceleration and radial acceleration when a body is moving in a circular path. What will happen to these accelerations if: i) body is rotating with uniform velocity and ii) body is moving on a straight path. (15)
- Q6 (a) Explain what is interference and how it is prevented? (5)
- (b) Find the expression for the length of the path of contact between the two mating gears. (10)
- Q7 Write the short note on: (8,7)