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Total Pages : 3

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August/September 2022
B.Tech. (ME) IV SEMESTER
Kinematics of Machines (PCC-ME-403-21)

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.*

4. *Drawing sheets are required to solve the questions.*

PART-A

1. (a) What is difference between Kinetics and Statics? (1.5)

(b) What is Spherical pair? (1.5)

(c) What is inversion of mechanism? (1.5)

(d) Explain the applications of double crank mechanism. (1.5)

(e) Explain instantaneous center method. (1.5)

(f) Why, Relative velocity method is more useful? (1.5)

(g) What is Gear train? (1.5)

(h) Name the different motion that a follower can have. (1.5)

(i) What is period of dwell? (1.5)

(j) What is number synthesis? (1.5)

PART-B

2. What is Kinematic pair? Classify the Kinematic pairs. (15)

3. (a) Explain the different types of constrained motions. (5)

   (b) Explain the inversions of four bar chain. (10)

4. The crank of slider crank mechanism is 150 mm and connecting rod is 750 mm. The crank rotates at a constant speed of 300 r.p.m. clockwise. Calculate the velocity and acceleration of the slider when crank has turned 30 degrees from inner dead center position. (15)

5. (a) What are advantages of epicyclic gearing? (5)

   (b) Explain what is interference and how it is prevented? (5)

   (c) With the help of neat sketch, explain the working of reverted gear train. (5)

6. (a) Draw the displacement, velocity and acceleration diagrams for a follower when it moves with SHM. (10)

   (b) What do you understand by Cam and followers? Name essential members of cam mechanism? (5)

7. A slider crank mechanism for its three positions $\theta 12 = 40$ degree and $\theta 13 = 80$ degree of the input link and three positions $S12 = 1.8$ cm and $S13 = 4.8$ cm of the output slider block is to be synthesized. Assume that the value of eccentricity, e = 0.9 cm. Synthesize the mechanism. (15)

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