



R18 Regulation *Subject code:2P3CC*
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, July 2024

KINEMATICS OF MACHINERY
(ME)

Maximum Marks: 70

Date:23.07.2024 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	Distinguish between a machine and mechanism.	1	L1
2	Define kinematic link, kinematic pair and kinematic chain.	1	L1
3	Why a roller follower is preferred to that a knife edged follower? Explain in brief.	2	L1
4	Define Coriolis component of acceleration.	2	L1
5	What is pantograph? Give any two applications of pantograph.	3	L1
6	Write types of exact straight-line motions?	3	L1
7	Write the types of pairs in Harts mechanism?	4	L1
8	Define cam and followers.	4	L1
9	Types of follower motions.	5	L1
10	Explain gear velocity ratio.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	Define Inversion. Sketch and explain the inversions of a four bar mechanism. [10M]	1	L2
OR			
12	Describe with a neat sketch the working of an Elliptical trammel is an inversion of double slider crank chain. Prove that the path traced by a link of the mechanism is an ellipse. [10M]	1	L2
13	In a pin pointed four bar mechanism, AB=300mm, BC=CD=360mm and AD=600mm long and AD is fixed. The angle BAD=60°. The crank AB rotates uniformly at 100rpm. locate all the Instantaneous centers and find the angular velocity of the link BC. [10M]	2	L2
OR			
14	In a four bar mechanism ABCD.AD is fixed and 120mm long. The crank AB is 30mm long and rotates at 100 rpm Clockwise, while the link CD=60mm oscillates about D. Find the angular velocity and angular acceleration of link CD. When angle BAD=60°. [10M]	2	L2

15	Derive the condition for correct steering. If the correct steering condition is not satisfied, then what happens? [10M]	3	L2
OR			
16	Define straight line motion mechanism. And explain Hart's mechanism with a neat sketch. [10M]	3	L2
17	Draw Displacement, Velocity & Acceleration diagrams when the follower moves with uniform Acceleration & Retardation. [10M]	4	L2
OR			
18	The following data relate to a cam operating an oscillating roller follower: Minimum radius of cam = 44mm. Diameter of roller = 14mm, Length of the follower arm = 40mm. Distance of fulcrum centre from cam centre = 50mm, Angle of ascent = 75° , Angle of descent = 105° , Angle of dwell for follower in the highest position = 60° , Angle of oscillation of follower = 28° . Draw the profile of the cam if the ascent and descent both take place with SHM. [10M]	4	L2
19	Derive a relation for minimum number of teeth on the gear wheel and pinion to avoid interference. [10M]	5	L2
OR			
20	The arm of an epicyclic gear train rotates at 100 rpm in anticlockwise direction. The arm carries two wheels A and B having 36 and 45 teeth respectively. The wheel A is fixed and the arm rotates about the centre of wheel A. Find the speed of wheel B. What will be the speed of B, if the wheel A instead of being fixed, makes 200 rpm clockwise? [10M]	5	L2