

B.TECH. DEGREE EXAMINATION, DECEMBER 2012**Fifth Semester**

Branch : Mechanical Engineering/Automobile Engineering

AU 010 504 }
ME 010 504 } KINEMATICS OF MACHINERY (AU, ME)

(Regular—New Scheme)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.***Part A***Each question carries 3 marks.*

1. Define kinematic chain and inversion.
2. List the advantages and vector approach of kinematic analysis.
3. How will you choose precision points in synthesis ?
4. What are polynomial cams ?
5. Discuss the significance of contact ratio.

(5 × 3 = 15 marks)

Part B*Each question carries 5 marks.*

6. Explain the working of a double slider crank chain.
7. Discuss complex number method of kinematic analysis.
8. Explain the role of function generator in synthesis.
9. Sketch any *three* types of followers.
10. Discuss the applications of rack and pinion gears.

(5 × 5 = 25 marks)

Part C*Each question carries 12 marks.*

11. Describe the working of a Whitworth quick-return motion mechanism.

Or

12. With neat sketch, explain any *two* straight line generation mechanisms.

Turn over

13. Explain in detail the application of digital computers in kinematic analysis of mechanisms. Discuss with flowcharts, any three of such applications.

Or

14. Explain the method of (i) displacement ; (ii) velocity ; and (iii) acceleration analysis of all inversions of a slider crank mechanism. Discuss how components of acceleration are determined.
15. Discuss the technique of three position synthesis of a four link mechanism.

Or

16. Explain the overlay method for kinematic synthesis. What are its applications ?
17. Discuss how the (i) Velocity and (ii) Acceleration curves vary with the follower motion and type of cam. What is the procedure for drawing cam profile ? Give any two typical examples.

Or

18. Explain the motion analysis in (i) Convex ; and (ii) Concave cams with footed followers. Draw neat sketches.
19. What is interference in gears ? Discuss its effect. What are the conditions necessary to avoid interference ? Explain.

Or

20. With neat sketch, explain the application of a planetary gear trains to the differential of an automobile.

(5 × 12 = 60 marks)