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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER MTECH DEGREE EXAMINATION MAY 2016

Mechanical Engineering

(Machine Design)

O1ME6102 Advanced Theory of Mechanisms

Max. Marks : 60 Duration : 3 Hours

Answer any TWO questions from each part

PART A

(Modules I & II)

1) The crank of a reciprocating engine is 27.5 cm long , connecting rod 75 cm and crank speed 150 rpm. Find the velocity and acceleration of piston and angular velocity and angular acceleration of the connecting rod when the angle which the crank makes with the line of stroke is 30 degree.

9 marks

2)Prepare short notes on following

i) Rotocentre ii) Burmester"s curve iii) Cubic of stationary curvature (3*3=9 marks)

3a) Explain the procedure for drawing inflection circle on a slider crank mechanism

(4 marks)

b) Give an account on Hartmans construction.

(5 marks)

(9x2=18 marks)

PART B

(Modules III & IV)

4) State and prove Roberts-Chebyshev theorem for four bar linkages 9 marks

5a) Sketch a cam – follower Mathematical model and explain on response of undamped cam Mechanism.

(6 marks)

b) What is meant by phase plane method?

(3 marks)

(P T O)

6a) Explain on Johnson"s numerical analysis

(4 marks)

b) Find the base circle diameter of disc cam width of a translating flat faced follower to have a total lift of 4 cm during 90 degree of rotation and return with SHM during 90 degree with equal dwells.

(5 marks)

(9 x 2 =18 marks)

PART C

(Modules V & VI)

7) Explain the procedure for Three Dimensional Dynamic Analysis of a four bar mechanism.

12 marks

8a) Explain pendulum method of measuring moment of inertia

(6 marks)

b) How will you evaluate kinetic energy of a rigid body in three dimension system.

(6 marks)

9) Discuss stability analysis of a two wheel vehicle negotiating a turn. 12 marks

(12 x 2 -24 marks)
