Name of subject: THEORY OF MACHINES   **Unit Test :I**

Subject code: 17412   **Course : ME**

Semester: VI

Chapter1

Q-1   Define the following terms with one example (3M)

   a)   Higher pair
   b)   Lower pair

Q-2   Explain the sliding pair with neat sketch. (3M)

Q-3   Define the following terms with one example (3M)

   a) Kinematic link
   b) Kinematic pair

Q-4 Define the terms statics and kinematics.(3M)

Q-5 Define the terms with one example. i) Kinematic pair   ii) kinematic link (3M)

Q-6 Explain crank and slotted lever mechanism with neat sketch.(4 M))

Q-7 State the inversions of four bar chain mechanism and explain any one with neat sketch.(4M)

Q-8 Give the classification of kinematic pairs. Explain any one .(4M)

Chapter2

Q-1 In reciprocating engine the crank is 250mm long and connecting rod is 1000mm long. The crank rotates at 150rpm. Find velocity and acceleration of piston and angular velocity and angular acceleration of connecting rod when the crank makes an angle of 30^0 to IDC. Use Relative velocity and acceleration method.(8M)

Q-2 The crank and connecting rod of a steam engine are 0.5m and 2m long respectively. The crank makes 180rpm in clockwise direction. When it has turned through 45^0 from IDC ,Find the velocity of piston and angular velocity of connecting rod by relative velocity method.(**4M**)

Q-3 PQRS is a four bar chain with link PS fixed. The length of the link are PQ= 62.5mm;QR = 175mm; RS=112.5mm; and PS=200mm.The crank rotates at 10 rad/s clockwise. Draw the velocity and

acceleration diagram when angle QPS=60^0.Q and R lie on same side of PS. Find angular velocity and angular acceleration of link QR.(8M)

Chapter3

Q-1 Define the following terms with one example. (3M)

i) Pitch Circle   ii) Pressure Angle iii)Lift of follower

Q-2 State any three applications of cam.(3M)

Q-3 Compare the knife edge follower with roller follower.(3M)

Q-4 Give the classification of followers and explain any one with neat sketch.(4M)

Q-5 Draw the profile of disc cam to give uniform velocity motion during outstroke of 40mm to a roller follower of diameter 20mm during the first half of cam rotation. The return of the cam takes place with SHM during remaining half of cam rotation. Draw the displacement diagram.(4M)

Q- 6 Draw the profile of cam to raise a valve with SHM through 45mm in $1/4^{th}$ of revolution, keep it fully raised through $1/10^{th}$ revolution and to lower it with uniform acceleration and retardation in $1/6^{th}$ revolution. The minimum radius of cam is 40mm.The axis of valve passes through axis of the cam shaft. Consider knife edge follower.   (8M)

Q-7 Draw the profile of a cam operating a roller reciprocating follower having a lift of 40mm. The roller diameter is 20mm. The minimum radius of cam is 30mm. The cam raises the follower with SHM for 110^0 of its rotation followed by a period of dwell for 80^0. The follower descend for next 120^0 rotations of cam follower with uniform velocity followed by dwell period. (8M)

Chapter4

Q1.State the effect of creep and slip of velocity ratio of belt .Also state the expression for them .(3M)

Q2.What are the condition under "V" belt drive is selected?(3M)

Q-3 Derive the expression for length of belt for open belt drive(4M)

Q-4 Write the difference between belt drive and gear drive. (4M)

Q-5 Derive the expression for tension ratio in flat belt.(8M)