

(3 Hours)

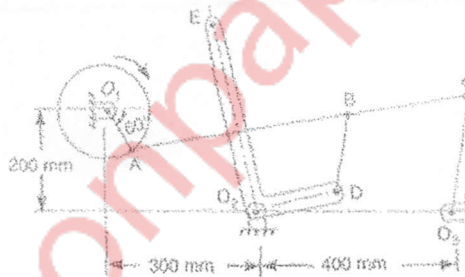
Total Marks: 80

- i) Question no. 1 is compulsory
 ii) Solve any three questions from remaining questions.
 iii) Assume suitable data wherever necessary with justification.



- Q.1** Solve any four questions from the following
- (a) Explain the types of pair with example? (05)
 - (b) Explain Tchebicheff's mechanism with neat sketch (05)
 - (c) Define the following terms as applied to a cam with neat sketch (05)
 - i) Base circle
 - ii) Pitch circle
 - iii) Prime circle
 - (d) State and explain the law of gearing (05)
 - (e) Differentiate between involute and cycloidal gear tooth profile. (05)

- Q.2** (a) The mechanism of wrapping machine as shown in figure has the following dimensions:
 $O_1A = 100$ mm, $AC = 700$ mm, $BC = 200$ mm, $BD = 150$ mm, $O_2D = 200$ mm, $O_2E = 400$ mm, $O_3C = 200$ mm. The crank O_1A rotates at a uniform speed of 100 rad/s. For the given configuration determine:
- i) linear velocity of point E on the bell crank lever by relative velocity method,
 - ii) acceleration of the point E and B,
 - iii) angular acceleration of the bell crank lever.



- (b) What is inversion? Explain any one inversion of four bar mechanism. (06)
- Q.3** (a) Construct a profile of a cam is to suit the following specifications: (14)
 Cam shaft diameter = 40 mm, least radius of cam = 25 mm, Diameter of roller = 25 mm, Angle of lift = 120° , Angle of fall = 150° , Lift of the follower = 40 mm, number of passes are two of equal interval between motions. During the lift the motion is S.H.M. During the fall the motion is uniform acceleration and retardation. The speed of the cam shaft is 500 rpm. The line of stroke of the follower is offset 12 mm from the centre of the cam. Also draw the displacement, velocity and acceleration diagram for one complete revolution of the cam shaft.
- (b) State and explain D'Alembert principle. (06)

TURN OVER

- Q.4 (a) A pulley is driven by a flat belt, the angle of lap being 120° . The belt is 100 mm wide by 6 mm thick and density 1000 Kg/m^3 . If the coefficient of friction is 0.3 and the maximum stress in the belt is not to exceed 2 MPa, find the greatest power which the belt can transmit and the corresponding speed of the belt. (10)
- (b) Derive an expression for minimum number of teeth required on the gear (T) in order to avoid interference in involutes gear teeth when it meshes with pinion (10)
- Q.5 (a) What are the various types of chain? Also derive an expression for length of chain. (10)
- (b) Two spur wheels of pitch circle diameter of 100 mm and 350 mm have involute teeth of 5 mm module and 20° pressure angle. The addenda are equal and it is as large as possible while avoiding the interference. If pinion rotates at 100 rpm, find (10)
- The addenda
 - The contact ratio
 - The sliding velocities at the beginning of point of contact and at the end of point of contact.
- Q.6 Explain the following (20)
- Work energy principle.
 - Instantaneous centres and its types.
 - Rubbing velocity.
 - Ackerman steering gear mechanism.
-

ediffmail

Mailbox of exam_kgce2010

Subject: Correction in Q.P Code : 16049 , THEORY OF MACHINES-I

From: University of Mumbai<support@muapps.in> on Wed, 23 May 2018 15:14:03

To: <exam_kgce2010@rediffmail.com>



University of Mumbai

Correction in Program Code : T1824 - **S.E.(MECHANICAL)(SEM IV)** (CBSGS)(REV-2012) / T1020
- **THEORY OF MACHINES-I** and T0524 - **S.E.(AUTOMOBILE)(SEM IV)** (CBSGS)(REV-2012) / T1061
- **THEORY OF MACHINES-I Q.P Code : 16049**

please find the attached google drive link for digram in Q.2) a)

<https://drive.google.com/file/d/1YDWcC82sOKQwIMpSLJNJ-PLFgPfy9c0m/view?usp=sharing>

University of Mumbai

<https://muapps.in>

support@muapps.in

022-26534263 / 022-26534266

Mon-Fri, 10am - 5pm

You have received this email because you are registered with us.

To unsubscribe; please reply to this mail with subject "Unsubscribe"

T1824 - S.E.(MECHANICAL)(SEM IV) (CBSGS)(REV-2012) T1020 - THEORY OF MACHINES-I 00016049

T0524 - S.E.(AUTOMOBILE)(SEM IV) (CBSGS)(REV-2012) T1061 - THEORY OF MACHINES-I 00016049

Q.2a. Refer the Fig.

