SE (mech) / sem-IV / T.O.M -I / 03/12/2014

QP Code :12464

CBS 48   (3 Hours)   **[Total Marks : 80**

N.B. (1) Question No. **1** is **compulsory**.
   (2) Attempt any **three** questions out of the remaining **five** questions.
   (3) **Figures** to the **right** indicate **full** marks.
   (4) Assume suitable **data** wherever required but justify the **same**.

1. Attempt any **four** of the following :—   **20**
   (a) What are the different types of kinematic pair ?
   (b) Classify cams in details.
   (c) State and explain D' Alemberts Principle.
   (d) What do you mean by interference in involute gears ?
   (e) Explain the terms slip and creep in belts.

2. (a) Sketch a polar velocity diagram of a Hooke's Joint and mark it's salient features.   **8**
   (b) A cam rotating at 150 rpm operates a reciprocating roller follower of radius 2·5 cm.   **12**
       The least radius of the cam is 5 cm and the stroke of the follower is 5 cm. Ascent
       and descent both takes place by uniform acceleration and retardation. Ascent takes
       place during 75° and descent during 90° of cam rotation. Dwell between ascent and
       descent is 60°. Sketch displacement, velocity and acceleration diagrams and mark
       salient features.

3. (a) What is a Pantograph? Show that it can produce paths exactly similar to the ones   **8**
       traced out by a point on a link on an enlarged or reduced scale.
   (b) In a mechanism shown in the **figure**, the crank OA is 100 mm long and rotates   **12**
       clockwise about O at 120 rpm. The connecting rod AB is 400 mm long. At a point C
       on AB, 150 mm from A, the rod CE 350 mm long is attached. This rod CE slides in
       a slot in a trunnion at D, The end E is connected by a link EF, 300 mm long to the
       horizontally moving slider F. For the mechanism in the position shown, find (i) velocity
       of F, (ii) velocity of sliding of CE in the trunnion and (iii) angular velocity of CE.

GN-Con.:9650-14.   **[TURN OVER**