

Code No: C8902

R09

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012**  
**ADVANCED MECHANICS OF MACHINERY**  
**(ENGINEERING DESIGN)**

**Time: 3hours**

**Max.Marks:60**

**Answer any five questions**  
**All questions carry equal marks**

- - -

1. How do we use the Bobillier theorem to find the inflection circle? Explain the Bobillier construction for locating the conjugate of an arbitrary point.
2. Explain the analytical and graphical procedure to evaluate the diameter of the inflection circle under the following cases.
  - (a) When one pair of conjugate points and the corresponding ray angle are given.
  - (b) When two pairs of conjugate points on different rays are given.
3. What is circling point curve? Present a graphical method for obtaining circling point curve for a four bar linkage.
4. Give the expression for the radius of curvature of the fixed polode. Explain the terms involved in the equation. Deduce the Hall's equation from this equation.
5. Explain the procedure for the function generation with the Overlay method using two parameter and three parameter assumptions.
6. Mechanize the function  $y = \log_{10} x$  between the limits  $1 < x < 10$  with precision points at  $x = 1$  and  $x = 10$  and precision derivatives at  $x = 1, 2, 4, 7,$  and  $10$ .
7.
  - (a) What is Rotocentre triangle? What are the properties of the Rotocentre triangle?
  - (b) Explain the construction of the Burmester's Curve with a suitable example.
8. Design a four bar mechanism for the following prescribed instantaneous values of angular velocity and angular acceleration of the three moving links.

Driving Link:  $\omega_1 = 10 \text{ rad/sec}$  &  $\alpha_1 = 0 \text{ rad/sec}^2$   
Coupling Rod:  $\omega_2 = 2 \text{ rad/sec}$  &  $\alpha_1 = 15 \text{ rad/sec}^2$   
Driven Link:  $\omega_3 = 5 \text{ rad/sec}$  &  $\alpha_3 = 10 \text{ rad/sec}^2$

\*\*\*\*\*