

Code: 9D15102

M.Tech I Semester Supplementary Examinations August/September 2018

**ADVANCED MECHANISMS**

(Machine Design)

(For students admitted in 2013, 2014, 2015 &amp; 2016 only)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain the mobility criteria for planar mechanisms and state its limitations.  
(b) Differentiate between spherical mechanism and spatial mechanism.
- 2 (a) Explain with neat sketch, Hartmann's constructions.  
(b) Explain the term collineation axis and its use for finding inflection points.
- 3 (a) State and prove Carter hall circle theorem.  
(b) Explain circling point curve for coupler of a four bar mechanism.
- 4 Explain in detail how Burmester curve will be drawn for a four bar mechanism.
- 5 Mechanize the function  $Y = \log_{10} X$  in the interval  $1 \leq X \leq 10$  with the range is divided into six intervals and use overlay method.
- 6 Design and draw a four bar mechanism such that the crank angles required will be coordinates as follows:

$\theta$	0	30	60
$\phi$	20	40	80
- 7 (a) Assign coordinate frames based on D-H representation for the SCARA.  
(b) Establish link coordinate system for a PUMA robot with neat sketch.
- 8 (a) Explain the formulation of Jacobian for planar manipulator.  
(b) Explain in brief about articulated and spherical manipulator.

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