



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35



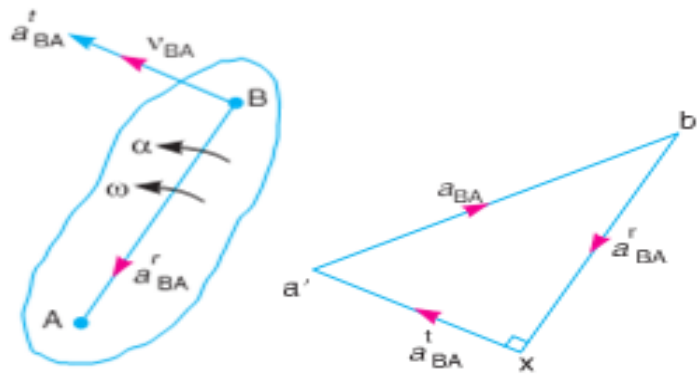
DEPARTMENT OF AERONAUTICAL ENGINEERING

AE 213 MECHANICS OF MACHINES

## Acceleration in Mechanisms

### Acceleration Diagram for a Link

Consider two points  $A$  and  $B$  on a rigid link as shown in Fig. Let the point  $B$  moves with respect to  $A$ , with an angular velocity of  $\omega$  rad/s and let  $\alpha$  rad/s<sup>2</sup> be the angular acceleration of the link  $AB$ .



Link

Acceleration diagram

The **centripetal or radial component**, which is perpendicular to the velocity of the particle at the given instant.

The **tangential component**, which is parallel to the velocity of the particle at the given instant.

### Problem:

The crank of a slider crank mechanism rotates clockwise at a constant speed of 300 r.p.m. The crank is 150 mm and the connecting rod is 600 mm long. Determine: 1. linear velocity and acceleration of the midpoint of the connecting rod, and 2. angular velocity and angular acceleration of the connecting rod, at a crank angle of  $45^\circ$  from inner dead centre position

