In a slider-crank mechanism, the crank is 480 mm long and rotates at 20 rad/sec in the counter-clockwise direction…………
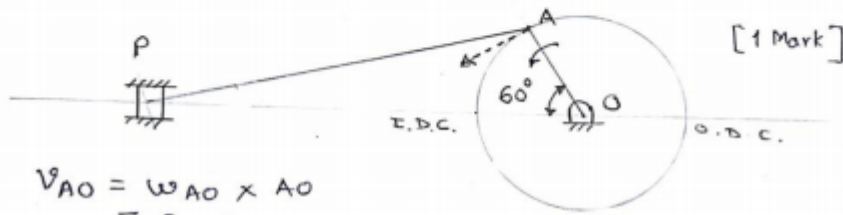
Question:
In a slider-crank mechanism, the crank is 480 mm long and rotates at 20 rad/sec in the counter-clockwise direction. The length of the connecting rod is 1600 mm. when the crank turns 60⬜ from the inner-dead centre. Determine the velocity of the slider by relative velocity method.
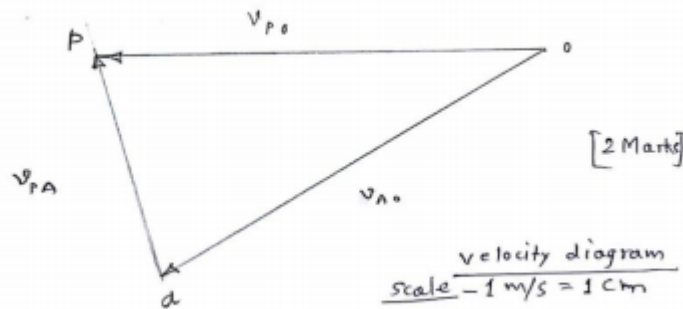
Answer:

Q 3(a)   Slider Crank mechanism

    Crank = 480 mm long = OA = 0.480 m

Connecting rod = 1600 mm long = AP

ω_{AO} = 20 rad/s ↻

scale 1:20

[1 Mark]

$V_{AO} = \omega_{AO} \times AO$

    = 20 × 0.480

    = 9.6 m/s

[2 Marks]

velocity diagram

scale — 1 m/s = 1 cm

Velocity of slider = V_{PO} = $\overrightarrow{PO}$ = 9.5 m/s   [1 mark]