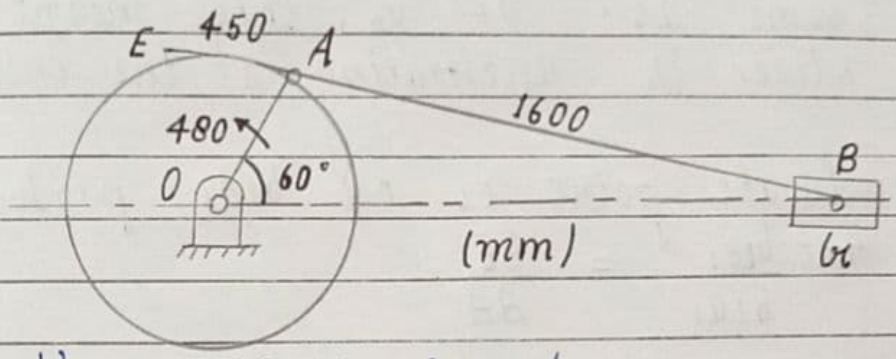
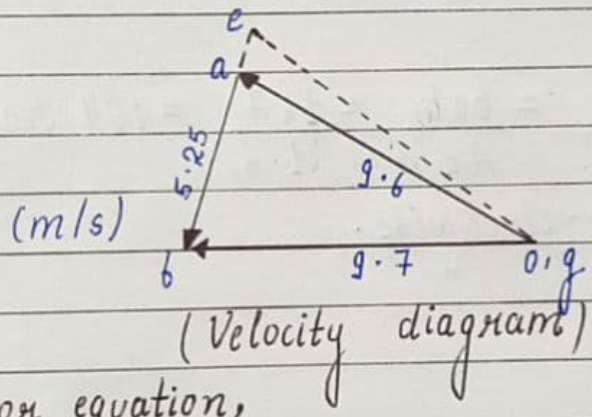
4·2·22

ASSIGNMENT - 4

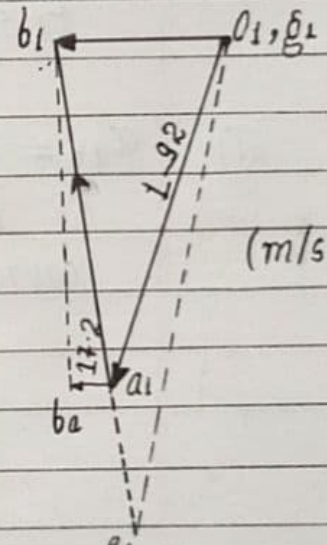
1.



Sol: $V_a = 20 \times 0.48 = 9.6 \text{ m/s}$



(Velocity diagram)



(acceleration diagram)

vector equation,

$$f_{bO} = f_{ba} + f_{aO}$$

or, $$f_{bg} = f_{aO} + f_{ba}$$
$$= f^c_{aO} + f^c_{ba} + f^t_{ba}$$

or, $$g_1b_1 = O_1a_1 + a_1b_a + b_ab_1$$

vector	Magnitude (m/s^2)	Direction	Sense
f^c_{aO} or O_1a_1	$\frac{(Oa)^2}{OA} = \frac{(9.6)^2}{0.48} = 192$	$\parallel$ OA	$\rightarrow O$
f^c_{ba} or a_1b_a	$\frac{(ab)^2}{AB} = \frac{(5.25)^2}{1.60} = 17.2$	$\parallel$ AB	$\rightarrow A$
f^t_{ba} or b_ab_1	-	$\perp$ AB	-
f_{bg} or g_1b_1	-	$\parallel$ to slider motion	-

i). $f_b = g_1 b_1 = 72\ m/s^2$

As the dirn of acceleration f_b is the same as of v_b, this means the slider is accelerating at the instant.

ii) Locate point e_1 on $b_1 a_1$ produced such that $\frac{b_1 e_1}{b_1 a_1} = \frac{BE}{BA}$

$f_e = o_1 e_1 = 236\ m/s^2$

iii) $\alpha_{ab} = \frac{f^t_{ba}}{AB} = \frac{ba\, b_1}{AB} = \frac{167}{1.6} = 104\ rad/s^2$

counter-clockwise.