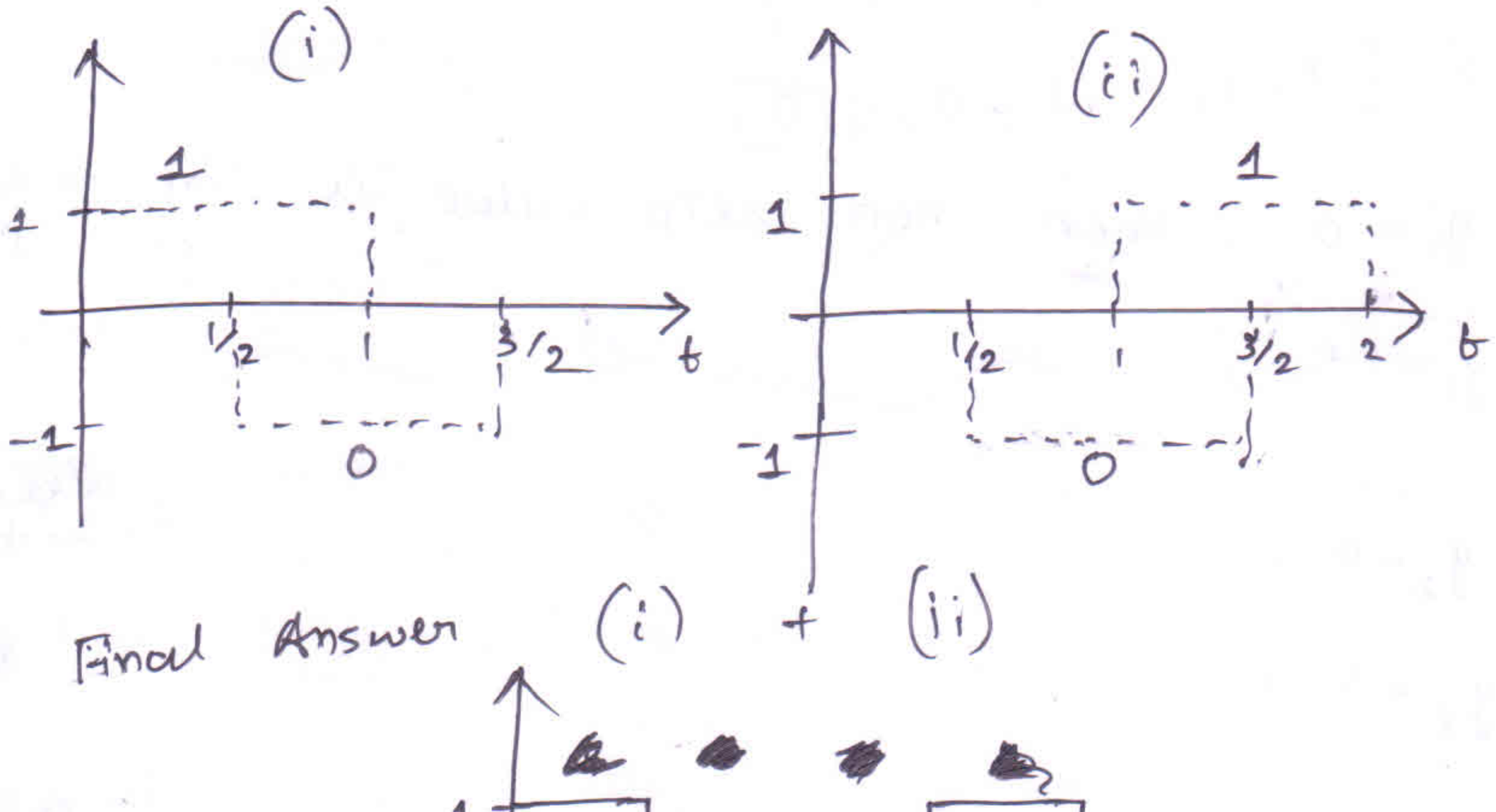
Sol 8. (a) Camera capture a frame every $\frac{1}{30}$ sec. For the black dot to appear stationary on the rim the wheel should complete 1 rotation in $\frac{1}{30}$ sec, 2 rotation in $\frac{1}{30}$ sec .... n rotation in $\frac{1}{30}$ sec

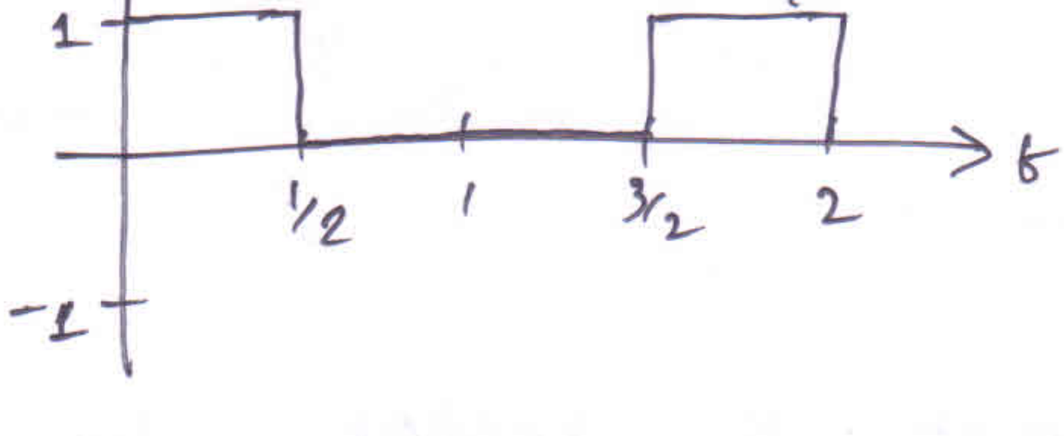
So the wheel should rotate at 30 rps, 60 rps, 90 rps .... 30n rps $(n \in N)$

(b) For this wheel should complete $1/2$ rev, $3/2$ revs, $5/2$ rev ~~...~~, $\left(n + \frac{1}{2}\right)$ revolution in $\frac{1}{30}$ sec. So wheel should rotate at $30\left(n+\frac{1}{2}\right)$ $(n \in N + \{0\})$ for two stationary dots.

Sol.9 (a)

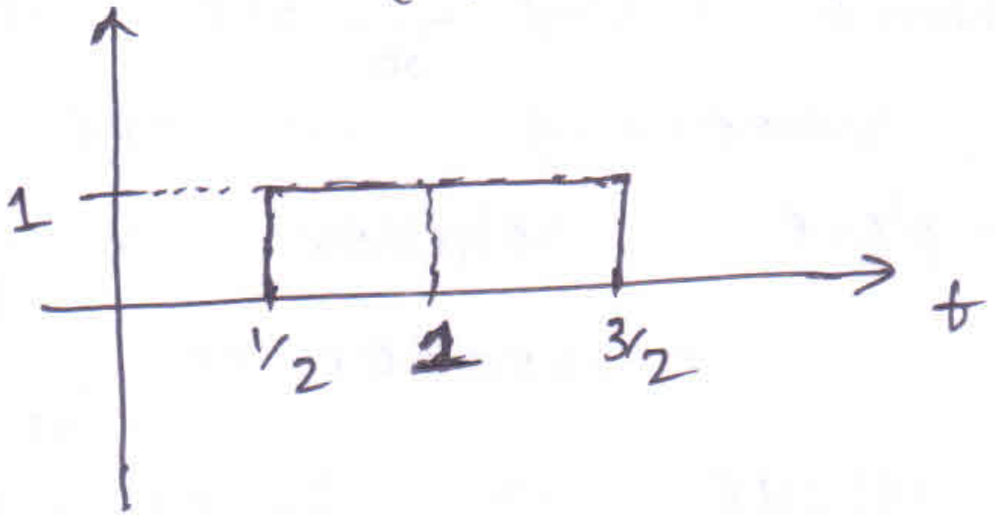


Final Answer (i) + (ii)

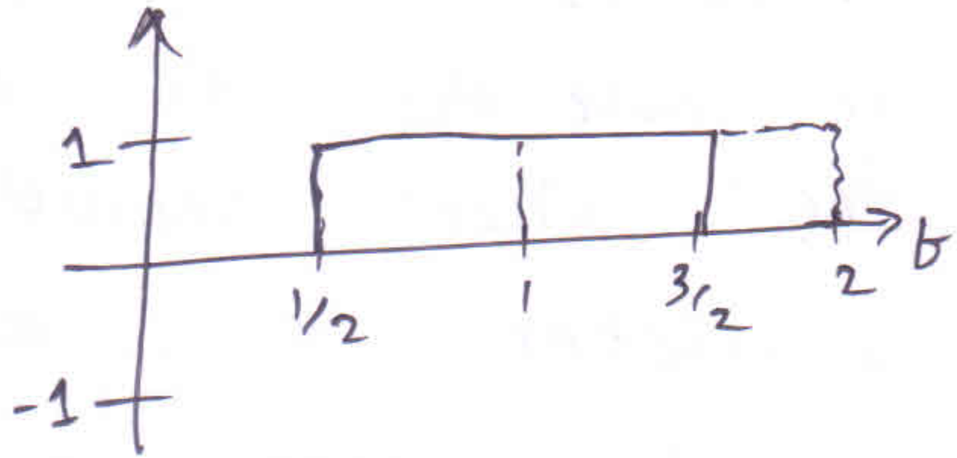


(b)

(i)



(ii)



Final Answer (i) + (ii)