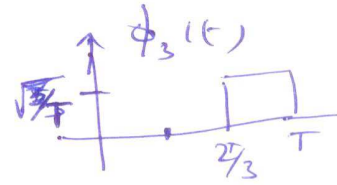
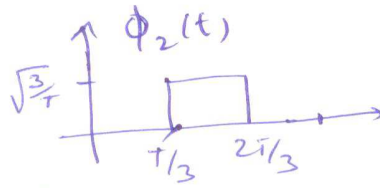
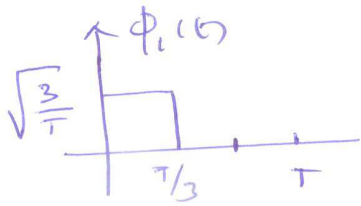


1.

[4 marks]



-2- marks

\* If only  $\phi_1(t)$  &  $\phi_2(t)$  are given, then also -2- marks if theorem of irrelevance is cited

\* If amplitude  $\sqrt{\frac{3}{T}}$  is not given or wrong, then subtract -1- mark

$$s_1 = \begin{bmatrix} \sqrt{\frac{T}{3}} \\ -\sqrt{\frac{T}{3}} \\ x \end{bmatrix} \rightarrow \text{irrelevant}$$

$$s_2 = \begin{bmatrix} \sqrt{\frac{T}{3}} \\ \sqrt{\frac{T}{3}} \\ x \end{bmatrix} \text{ \& so on}$$

$$d_{\min} = \left( \left( \sqrt{\frac{T}{3}} + \sqrt{\frac{T}{3}} \right)^2 \right)^{\frac{1}{2}} = \boxed{2\sqrt{\frac{T}{3}} ;}$$

-2- marks

Corresponding energy  $\rightarrow$  (distance)<sup>2</sup> in Joules =  $4\frac{T}{3}$  Joules.

only -1- mark if this is given as  $d_{\min}$