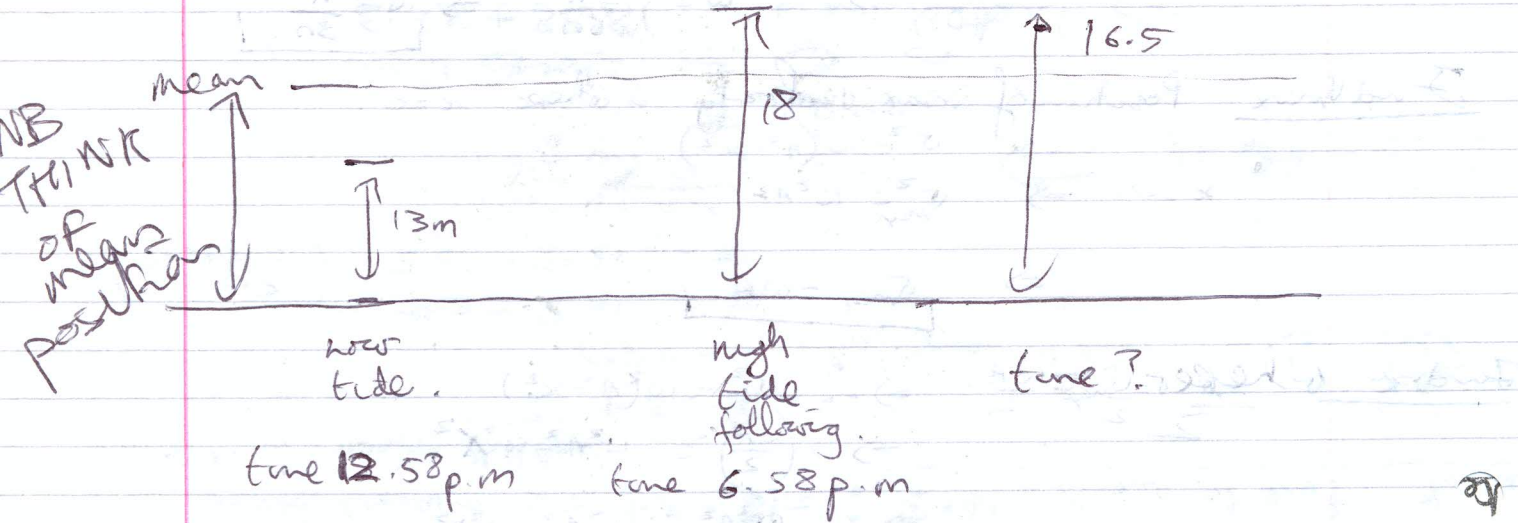


1990 6 (B)

Rise, falls with SHM



Find A High - Low tide =  $18 - 13 = 5$ .

$\Rightarrow$  Amplitude of motion is  $\frac{5}{2} \text{ m}$   $A = 2.5$

Find mean  $\Rightarrow$  MEAN POSITION at  $13 + 2.5 = 15.5 \text{ m}$

Find  $\omega$  Time between Low and high tide =  $6.58 \text{ p.m.} - 12.58 \text{ p.m.}$

$= 18.58 - 12.58$

$= 6 \text{ hours}$

$\Rightarrow$  Time low to high to low =  $6 + 6 = 12 \text{ hours}$ .

$\Rightarrow$   $T = 12 \text{ hours}$

$T = \frac{2\pi}{\omega} \Rightarrow 12 = \frac{2\pi}{\omega} \Rightarrow$   $\omega = \frac{\pi}{6}$

Latest time to reach 16.5 :  $= 18.58 + \text{time to travel from high tide extreme to } 16.5$

$= 18.58 + t$

Let  $x =$  time to travel from  $A = +2.5$  to  $x = 16.5 - \text{mean} = 16.5 - 15.5 = 1$   $(15.5 = 13 + 2.5)$

$\therefore x = A \cos \omega t \Rightarrow 1 = 2.5 \cos \frac{\pi}{6} t$

$\Rightarrow 2.5 \cos \frac{\pi}{6} t = 1$

$\Rightarrow t = 2 \text{ hours } 13 \text{ min}$

$\Rightarrow$  Latest time is  $18.58 + 2 = 20.58$

$= 21:11$

OR 9:11 p.m.

Post Note

