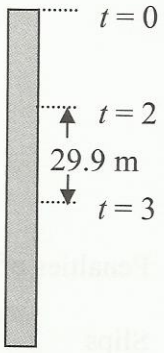
2007

1. **(a)** A particle is projected vertically downwards from the top of a tower with speed u m/s. It takes the particle 4 seconds to reach the bottom of the tower.

During the third second of its motion the particle travels 29.9 metres.



Find

(i) the value of u

(ii) the height of the tower.

(i) $s = ut + \frac{1}{2}ft^2$

$h = u(2) + 4.9(4)$

$h + 29.9 = u(3) + 4.9(9)$

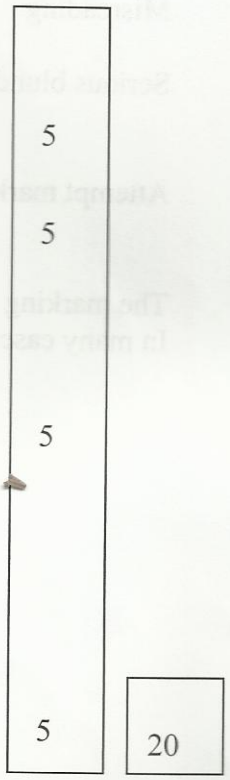
$29.9 = u + 24.5$

$u = 5.4$ m/s

(ii) $s = ut + \frac{1}{2}ft^2$

$= 5.4(4) + 4.9(16)$

$= 100$ m



OR

(i) Third second :

$s = ut + \frac{1}{2}ft^2$

$29.9 = u(1) + 4.9(1)$

$u = 25$

First two seconds :

$v = u + at$

$25 = u + 9.8(2)$

$u = 5.4$ m/s