H.W (1/7/2021)

Numerical

1. ——

a) $a = g = (-ve) = -9.8 \text{ m/s}$

$$v^2 = 2as + u^2$$
$$v^2 = 2 \times -9.8 \times 50 + (10)^2$$
$$v^2 = -19.6 \times 50 + 100$$
$$v^2 = -980 + 100$$
$$v^2 = -880$$
$$v = \sqrt{-880}$$
$$v = 29.66i$$

b) $$s = ut + \frac{1}{2}at^2$$

s = net displacement

$s = -h = -50$

$u = = 10 \text{ m/s}$

$g = -9.8 \text{ m/s}^2$

$$-50 = 10 \times t + \frac{1}{2} \times -4.9 \times t^2$$

$$-50 = 10t - 4.9t^2$$

$= 4.9t^2 - 10t - 50 = 0$

$t = 4.3$ sec.

2. —

a) $t = 5s$

$u = 0$ sec

$g = 9.8 m/s^2$

~~$v = u + gt$~~

$v = 0 + 9.8 \times 5$

$v = 49$ sec.

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

$$= 0 \times 5 + \frac{1}{2} \times 9.8 \times (5)^2$$

$$= \frac{1}{2} \times \cancel{9.8} \times 25$$

$$= 122.5 m.$$

∴ the height = 122.5m

b) distance travelled in 4sec,

$$= \frac{1}{2} \times ut + ut + \frac{1}{2} at^2$$

$$= 0 \times 4 + \frac{1}{2} \times 4.9 \times (4)^2$$

$$= 4.9 \times 16$$

$$= 78.4m.$$

distance travelled in last second,

= distance travelled in 5 sec − distance travelled in 4sec.

$= 122.5 - 78.4.$

$= 44.1m.$

∴ the ans $= 44.1m$