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

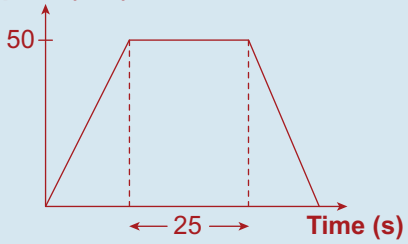
$s = 0(5) + \frac{1}{2}(4)(25) = 50$ m

(iii) Remaining distance = 200 m.

200 m at 20 m/s takes 10 seconds.

The total time taken = 5 + 10 = 15 s

Q. 3. (i)



During acceleration

$u = 0, \quad v = 50, \quad a = 5$

$v = u + at$

$50 = 0 + 5t$

$t = 10$ s

During deceleration

$u = 50, \quad v = 0, \quad a = -10$

$v = u + at$

$0 = 50 - 10t$

$10t = 50$

$t = 5$ s

Total distance travelled = Area under graph

$= \frac{1}{2}(10)(50) + (25)(50) + \frac{1}{2}(5)(50)$

$= 250 + 1{,}250 + 125$

$= 1{,}625$ m

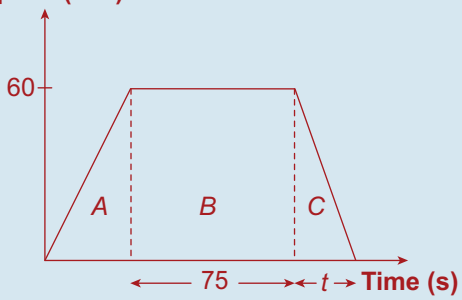
(ii) Average speed $= \frac{\text{Total distance}}{\text{Total time}}$

$= \frac{1{,}625}{10 + 25 + 5}$

$= \frac{1{,}625}{40}$

$= 40.625$ m/s

Q. 4. Speed (m/s)



(i) **During deceleration**

Area under graph = 150

Area $C = 150$

$\frac{1}{2}(t)(60) = 150$

$30t = 150$

$t = 5$ s

(ii) **During acceleration**

$u = 0, \quad v = 60, \quad a = 3$

$v = u + at$

$60 = 0 + 3t$

$t = 20$ s

Total distance covered = Area under graph

$= \frac{1}{2}(20)(60) + (75)(60) + 150$

$= 600 + 4{,}500 + 150$

$= 5{,}250$ m

(iii) Average speed $= \frac{5{,}250}{100}$

$= 52.5$ m/s

Q. 5. (i) $v^2 = u^2 + 2as$

$(40)^2 = 0^2 + 2(2)s$

$s = 400$ m

$v = u + at$

$40 = 0 + 2t$

$t = 20$ s

(ii) $v^2 = u^2 + 2as$

$0 = (40)^2 + 2(-5)s$

$s = 160$ m

$v = u + at$

$0 = 40 + (-5)t$

$t = 8$ s

(iii) Remainder = 1,000 − 400 − 160 = 440 m

440 m at 40 m/s takes 11 seconds.

∴ Total time = 20 + 11 + 8 = 39 s

Q. 6. (i) $v = u + at$

$27 = 0 + a(9)$

$a = 3$ m/s^2