Appendix 3.10

(1) (a)

Interval	(i)	(ii)	(iii)
I	positive	increasing at steady rate	positive
II	positive	steady	zero
III	positive	increasing at rate that is not steady	positive
IV	positive	steady	zero
V	positive	decreasing at steady rate	negative
VI	zero	steady	zero
VII	negative	increasing at steady rate	negative

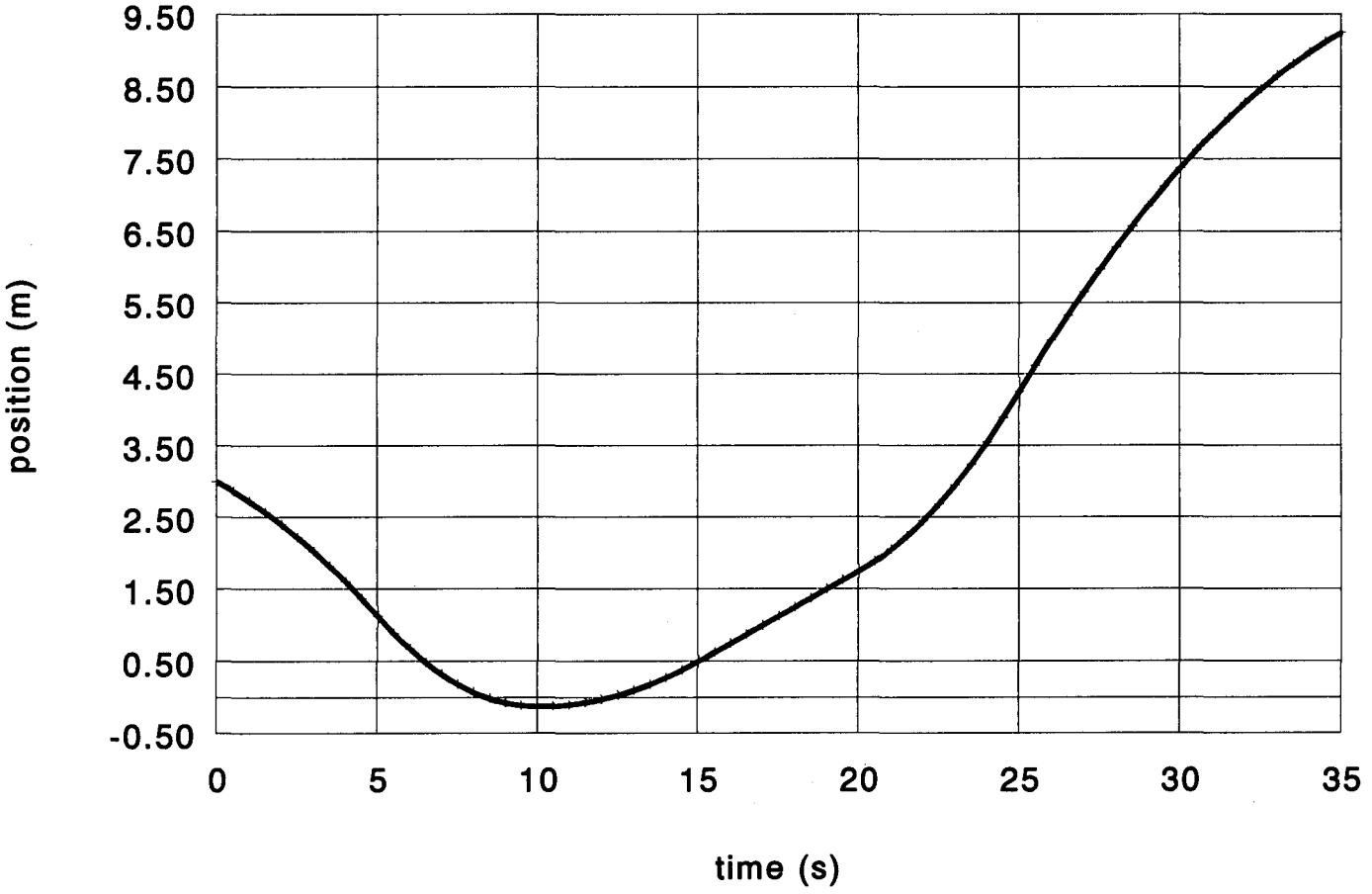
(b) IV - velocity is the fastest therefore more distance will be covered in the same amount of time

(2) (a)

t	displacement is area	position
0		3m
5	$\frac{-.25(5)}{2} + 5(-.25) = -1.875$	1.125 m
10	$\frac{-.5(5)}{2} = -1.25$m	-.125 m
15	$\frac{.25(5)}{2} = .625$ m	.5 m
20	$.25(5) = 1.25$ m	1.75 m
25	$\frac{.5(5)}{2} + .25(5) = 2.5$	4.25 m
35	$\frac{.5(10)}{2} + .25(10) = 5.0$	9.25m

Position-Time

Appendix 3.10 Q2a



(3)(a)

Δt	Δv	$a = \Delta v / \Delta t$
0 – 5	$-.5 - -.25 = -.25$	$-.05\ m/s^2$
5 – 10	$0 - -.5 = .5$	$.1\ m/s^2$
10 – 15	$.25 - 0 = .25$	$.05\ m/s^2$
15 – 20	$.25 - .25 = 0$	$0\ m/s^2$
20 – 25	$.75 - .25 = .5$	$.1\ m/s^2$
25 – 35	$.25 - .75 = -.5$	$-.05\ m/s^2$

(c) $a_{avg} = \frac{\Delta v}{\Delta t} = \frac{.25 - -.5}{20 - 5} = \frac{.75}{15} = .05\ m/s^2$

(5) (a) acceleration at 20 s.

$\frac{\Delta v}{\Delta t} = \frac{-2.5 - 0}{20 - 15} = \frac{-2.5}{5} = -.5\ m/s^2$

(b) 10s $\frac{\Delta v}{\Delta t} = \frac{7.5 - 0}{10 - 0} = .75\ m/s^2$

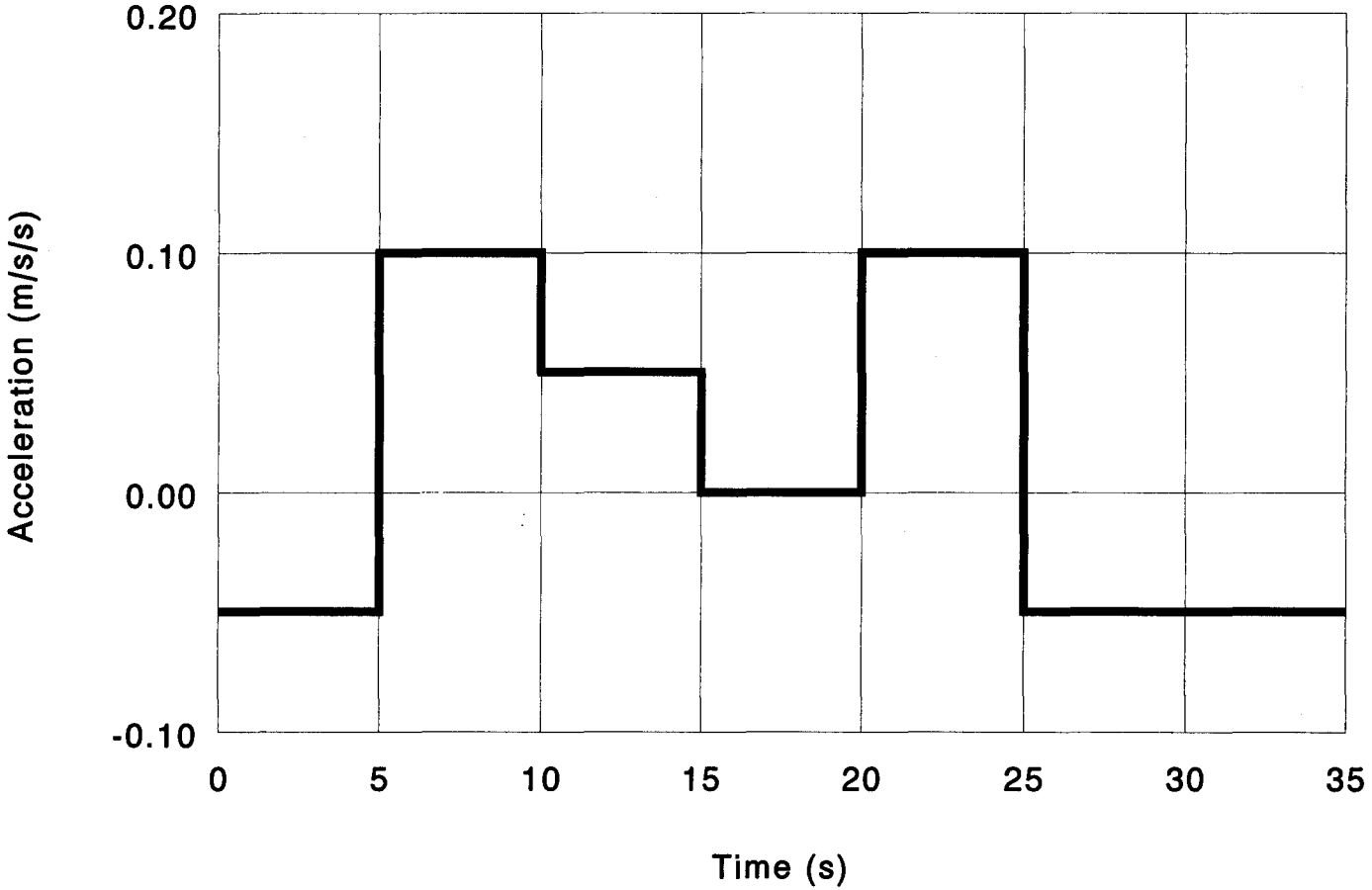
30s $\frac{\Delta v}{\Delta t} = \frac{0 - 0}{30 - 25} = 0\ m/s^2$

(c) Speed is the greatest at 10s, so any time interval that contains 10 s.

(d) 15 – 35s

Acceleration-Time

Appendix 3.10 Q3b



Appendix 3.10 Question 4