

Kinematics Unit Test

Answer Section

MULTIPLE CHOICE

1. C
2. B
3. B
4. B
5. C
6. D
7. D
8. D
9. C
10. D

(10)

COMPLETION

11. a) object is stopped
- b) object is accelerating to a maximum speed and then slowing down to zero
- c) object starts from rest and accelerates backwards
- d) object decelerates to zero and then accelerates forward

(7)

SHORT ANSWER

12. a) $v = -12\text{m}/5\text{s} = -2.4\text{ m/s}$ (3) b) d at 25 seconds was -4 m (1)
- c) total distance was $8 + 12 = 20\text{ m}$ (1) d) 0 m/s (1)
- f) $-4\text{m}/25\text{s} = -0.16\text{ m/s} = -0.2\text{ m/s}$ (3)
13. $d = \frac{1}{2}(20)(15) + 20 \times 25 = 650\text{ m} = 600\text{ m}$ (4)
14. it will go six times as high, since $a = 1/6$ as big and both speeds are the same, then $d = 6 \times$ as big

(12)

use the formula $v_2^2 = v_1^2 + 2ad$

$$\frac{v_2^2 - v_1^2}{2a} = d$$

(4)

16. use quadratic with $553 = 5.0t + \frac{1}{2}(9.8)t^2$
 OR $v_2^2 = 5^2 + 2(9.8)(553)$ $v_2 = 104\text{m/s}$
 $t = \frac{104\text{m/s} - 5\text{m/s}}{9.8\text{m/s}^2} = 10.1\text{s} = 10.5$

PROBLEM

15. $-1.7\text{ m/s}^2 = -2\text{ m/s}^2$ (3)

16. 10s (6)

17. 1.2 minutes (3)

(5) 18. calculate distance for each and compare : 10 m ahead

(6) 19. $t = 22.9\text{ seconds}$ $d = 550\text{ m}$

17. $t = \frac{d}{v} = \frac{1\text{km}}{50\text{km/h}} = .02\text{ h} = 1.2\text{min}$

18. Jeremy $d = 6\text{m/s} \times 10\text{s} = 60\text{m}$
 Hannah $d = 4(10) + \frac{1}{2}(\frac{6}{10})10^2 = 70\text{m}$
 or $d = (\frac{4+10}{2})10 = 70\text{m}$

19. $v_1 t = \frac{1}{2} a t^2$
 $24t = \frac{1}{2}(2.1)t^2$
 $\frac{24}{1.05} = t = 22.9\text{s}$

$d = 24(22.9) = 549.6$
 $d = \frac{1}{2}(2.1)(22.9)^2 = 550.6$

$d = 550\text{m}$

60 MARKS