

P.1 MEMO June 09

PHYSICAL SCIENCES GRADE 10

QUESTION 1

- 1.1 velocity (1)
  - 1.2 weight (1)
  - 1.3 Refractive index (1)
  - 1.4 Light beam (1)
  - 1.5 Virtual image (1)
- [5]

QUESTION 2

- 2.1 displacement ... or ... gradient (2)
  - 2.2 instantaneous ... or ... over a period of time (2)
  - 2.3 half the VERTICAL distance (2)
  - 2.4 moves PARALLEL to the base (2)
  - 2.5 crest and crest ... or ... trough and trough (2)
- [10]

QUESTION 3

3.1	A	B	C	D
3.2	A	B	C	D
3.3	A	B	C	D
3.4	A	B	C	D
3.5	A	B	C	D

[5 X 2 = 10]

TOTAL SECTION A: 25 MARKS

QUESTION 4

4.1

$$v_f = v_i + at$$

$$a = \frac{v_f - v_i}{\Delta t}$$

$$= \frac{20 - 0}{16}$$

$$= 1,25 \text{ m} \cdot \text{s}^{-2}$$

4.2.1 Terry's time

$$\Delta x = v_i t + \frac{1}{2} at^2$$

$$60 = 12t + 0$$

$$t = 5 \text{ s}$$

OR

$$v = \frac{\Delta x}{\Delta t}$$

$$\Delta t = \frac{\Delta x}{v}$$

$$= \frac{60}{12}$$

$$= 5 \text{ s}$$

Talula's time

$$t = \frac{v_f - v_i}{a}$$

$$= \frac{16 - 10}{1,3}$$

$$= 4,64 \text{ s}$$

Talula's time < Terry's time  
Talula wins

(8)

4.3.1  $\Delta x$  travelled in 2s

$$\Delta x = v_i t + \frac{1}{2} at^2$$

$$= 80 \times 2$$

$$= 160 \text{ m}$$

OR

$$v = \frac{\Delta x}{\Delta t}$$

$$\Delta x = 80 \times 2$$

$$= 160 \text{ m}$$

$\Delta x$  travelled to come to a stop

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$0 = (80)^2 + 2(-5)\Delta x$$

$$\Delta x = \frac{6400}{10}$$

$$= 640 \text{ m}$$

$$\Delta x_{\text{total}} = 100 + 160 + 640 + 900 \text{ m}$$

$$\Delta x_{\text{left to end of runway}} = 1500 \text{ m} - 900 \text{ m}$$

$$= 600 \text{ m}$$

(9)

QUESTION 5

- 5.1 0 to 2s: accelerates uniformly east
- 2 to 6s: constant velocity east
- 6 to 8s: decelerates east/accelerates west
- 8 to 10s: accelerates west

(-1 mark if no direction 0 to 8s)  
(no mark if no direction for 8 to 10s) (4)

5.2

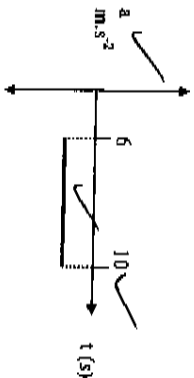
$$a_{\text{grass}} = a_{\text{...}} = \frac{\Delta v}{\Delta t}$$

$$= \frac{-20 - 20}{10 - 6}$$

$$= -10 \text{ m} \cdot \text{s}^{-2}$$

(4)

5.3



1 mark for axes  
1 mark straight line below time axes  
1 mark for correct time interval (3)

5.4

$$\Delta x = \text{total area under graph}$$

$$= (2 \times 10) + (1/2 \times 2 \times 10) + (4 \times 20) + (1/2 \times 2 \times 20) + (1/2 \times 2 \times (-20))$$

$$= 20 + 10 + 80 + 20 - 20$$

$$= 110 \text{ m}$$

(4)

5.5

$$\text{Total distance} = 20 + 10 + 90 + 20 + 20$$

$$= 150 \text{ m}$$

(2)

091078

**QUESTION 6**

6.1.a) A, C ✓ (2)

6.1.b) B ✓ (1)

6.2) Down ✓ (1)

6.3)  $T = \frac{8}{10} = 0.8s$  ✓ (3)6.4)  $f = \frac{1}{T} = \frac{1}{0.8} = 1.25 Hz$  ✓ (2)6.5)  $v = f \times \lambda = 1.25 \times 10 = 12.5 m s^{-1}$  ✓ (3)**QUESTION 7**

7.1) Line drawn perpendicular to the surface ✓ (2)

7.2) Less ✓ (2)

7.3)  $90^\circ$  ✓ (2)

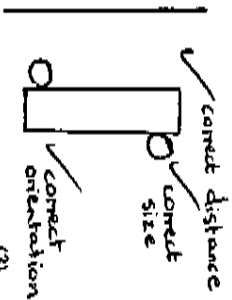
7.4) Total internal reflection ✓ (2)

7.5) Move from a more optically dense medium to a less optically dense medium. ✓ (2)

7.6) Telecommunications, decorations, medicine. ✓ (2)

**QUESTION 8**

8.1)



(3)

8.2.a) Larger ✓ (2)

8.2.b) Upright ✓ (2)

**QUESTION 9**

9.1) Inverted ✓ (1)

9.2) Upright ✓ (1)

9.3) Upright ✓ (1)

9.4) Upright ✓ (1)

9.5) Constructive ✓ (2)

**TOTAL: 100 MARKS**