TEACHERS WITHOUT BORDERS PROGRAMME

BROUGHT TO YOU BY

With grateful thanks to our associate partners, The National Department of Basic Education, The Independent Examinations Board, Siyavula Education, Smarticks, Noteshare, Lemonlicious, datacentrix, and most of all, to the schools and teachers from both the public and private education sectors who as founder contributors, have lent content to the Teachers without Borders programme, for the benefit of all South Africa's learners.

In Bill Gates words, at the Mandela Day 'Living Together' address: "Maintaining the quality of this country's higher education system while expanding access to more students will not be easy. But it's critical to South Africa's future" – working together, we can help achieve this."

Contributing schools to date:

Clifton School	Milnerton High	Rustenburg Girls' High	St Peter's
Durban Girls'	Northwood High	St Anne's DC	St Stithians
Fairmont High	Roedean	St John's DSG	Wynberg Boys' High
Herzlia High	Rondebosch Boys'	St Mary's DSG Kloof	Wynberg Secondary

QUESTION 1

1.1 D
1.2 A
1.3 A
1.4 C
1.5 B
1.6 B
1.7 A
1.8 A
1.9 D
1.10 B

10 x 2 = [20]

QUESTION 2

2.1 9,8 $m.s^{-2}$ √ down√ (2)

2.2 v = u + at√
0 = 15 √ + (-9,8)t √
t = 1,53 s √ (4)

2.3 $v^2 = u^2 + 2as$ √
$0 = (15)^2$ √ + 2(-9,8)s√
s = 11.48 m√

OR s = ut + ½ at^2 √
= (15)(1,53) √ + ½(-9.8)$(1,53)^2$√
= 22,95 – 11,47
= 11,48 m√ (4)

2.4 s = ut + ½ at^2 √
= (15)(2) √ + ½ (-9,8)$(2)^2$ √
= 30-19,6
= 10,4 m √ (4)

2.5 v-t graph (3)

[17]

QUESTION 3

3.1 118,8 km.h^{-1} √ (1)

3.2 Acceleration: the rate of change √ of velocity.√ (2)

3.3 s = v x t
= 33 x 0,3√
= 9,9 m√ (2)

3.4 $v^2 = u^2 + 2as$ √
$0 = (33)^2$ √+ 2a(50 – 9,9)√
0 = 1089 + 80,2a
a = - 13,58 m.s^{-2}
= 13,58 m,s^{-2} √ backwards/opp direction√ (5)
[10]

QUESTION 4

4.1 Velocity decreases √ (from 15 m.s^{-1} to 0)√ in Northerly √direction.
Acceleration constant √ and (negative) South.√ (Uniform deceleration) (5)

4.2 5-7 s (CD) (1)

4.3 BCDE OR B to E (1)

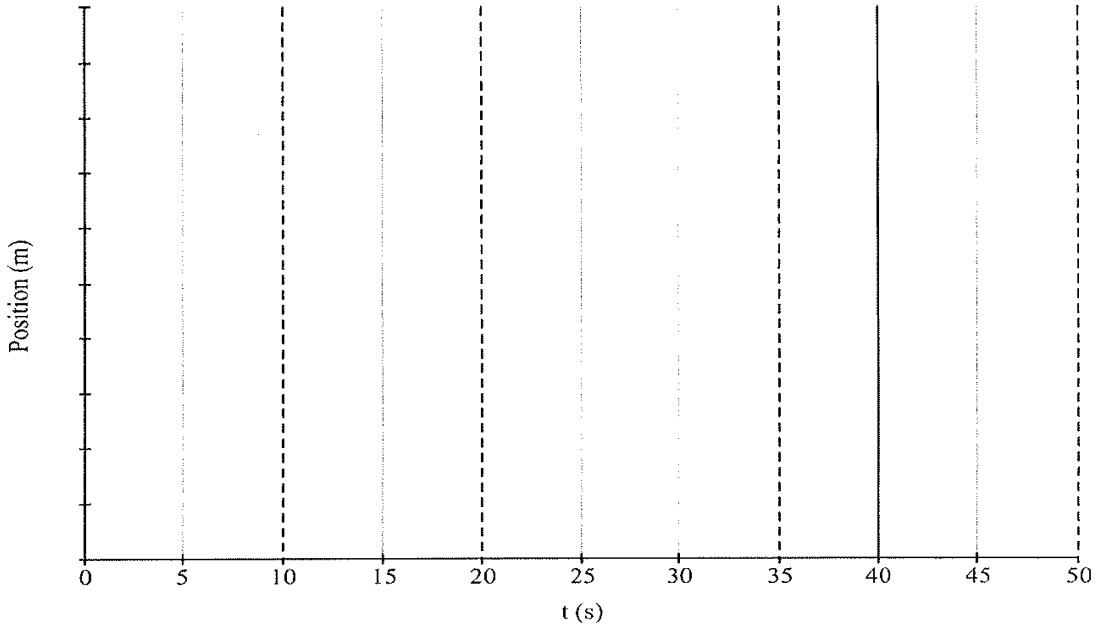
4.4 distance = area = 1/2b.h + l x b √
= ½(3)(15) √ + ½(2)(10)√
= 22,5 + 10
= 32,5 m √ (4)

4.5 22,5 – 10 = 12,5 √ North √ (2)

4.6 acceleration = gradient = Δy/Δx √ OR -10 – 15/5
= 0 - 15√/3√ = -25/5
= - 5 m.s^{-2} = - 5 m.s^{-2}
= 5 m.s^{-2} √ South√ (5)

OR v = u + at
0 = 15 + a3
a = - 5 m.s^{-2}

4.7 (7)



[25]

QUESTION 5

5.1 Valency: the combining power of an atom (charge) √/ the number of electrons an atom needs to gain/lose or share
Valence electrons: the electrons in the outer orbital√ (2)

5.2.1 Li: $1s^2 2s^1$ √ (1)

5.2.2 Ca^{2+} $1s^2 2s^2 2p^6$ √ $3s^2 3p^6$ √ (2)

5.3.1 Lewis dot: O (1)

5.3.2 Aufbau F^- (2)

5.4.1 Salt √ (1)

5.4.2 NaCl √ (1)

5.4.3 2Na √ + Cl_2 √→ 2NaCl√ bal √ (4)

5.5.1 Sublimation: where there is a phase change √ from solid to gas√, (without going through the liquid phase.) (2)

5.5.2 Linear √ (1)

5.5.3 London forces/ induced dipole forces √ (1)

5.5.4 dipole √ -induced dipole forces √ (2)

5.6 Room temp greater than fridge temp.√
This weakens the IMF between the butter particles.√
Thus the spaces between the particles increases.√ (3)

[23]

QUESTION 6

6.1.1 54 ^{0}C √ (1)

6.1.2 93 ^{0}C √ (1)

6.1.3 No √. Melting and boiling points are not those for water. √ (2)

6.1.4 (a) Liquid and gas√ (1)

(b) Solid √ (1)

6.1.5 The temp remains constant. √ There is no increase of kinetic energy/Kinetic energy remains the same.√ (2)

6.2.1 (a) He √ (1)

(b) NH_3 √ (1)

(c) NaCl √ (1)

(d) CCl_4 (1)

6.2.2 (a) London/induced dipole √ (1)

(b) dipole-dipole √ (1)

(c) Ion forces √ / electrostatic forces (1)

(d) London/induced dipole √ (1)

6.2.3 (a) NH_3 √ (1)

(b) CH_4 OR CCl_4 √ (1)

(c) HCl √ (1)

[19]

QUESTION 7

7.1.1 S √ (1)

7.1.2 S √ (1)

7.2.1 Q and Y √ (1)

7.2.2 1 √ (1)

7.3.1 Y √ (1)

7.3.2 K^+ / Y^+ √ (1)

7.4 Argon √ $^{40}_{18}Ar$√ (2)

7.5.1 Q_2P / Li_2S √ (1)

7.5.2 RT_2 / $CaCl_2$ √ (1)

7.6.1 Isotope: An atom that has the same atomic number √ but a different number of Neutrons/ atomic mass.√ (2)

7.6.2 RAM = [15/20 x 25] + [5/20 x 23]

= 18,75 √ + 5,75√

= 24,5 √ (3)

7.6.3 X-25 √ (1)

[16]