



Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

PHYSICAL SCIENCES P1
(CHEMISTRY)
COMMON TEST
MARCH 2016
MEMORANDUM

NATIONAL
SENIOR CERTIFICATE

GRADE 11

MARKS : 50

TIME : 1 hour

N.B: This memorandum consists of 4 pages.

QUESTION 1

- 1.1 D ✓✓
- 1.2 C ✓✓
- 1.3 A ✓✓

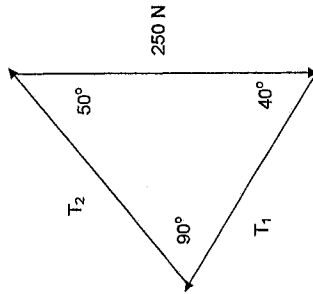
[6]

QUESTION 2

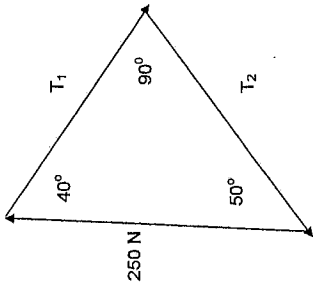
2.1 Equilibrium means that all the forces on the system have a net force of zero. OR are balanced ✓✓

(2)

2.2



Or



Criteria for marking	Marks
Correct labels	✓
Correct direction	✓
All angles correct	✓✓

(4)

$$2.3 \quad T_1 = 250 \sin 50^\circ \checkmark = 191,51 \text{ N} \checkmark$$

Or

$$T_1 = 250 \cos 40^\circ \checkmark = 191,51 \text{ N} \checkmark$$

And

$$T_2 = 250 \cos 50^\circ \checkmark = 160,70 \text{ N} \checkmark$$

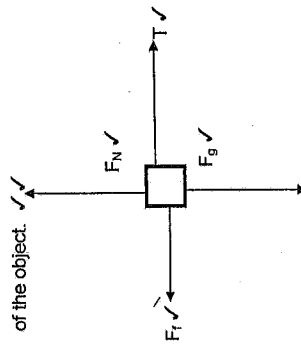
Or

$$T_2 = 250 \sin 40^\circ \checkmark = 160,70 \text{ N} \checkmark$$

(4)
[12]**QUESTION 3**

- 3.1 If a net force is exerted on an object, the object will accelerate with an acceleration that is directly proportional to the net force and inversely proportional to the mass of the object. ✓✓ (2)

3.2



3.3 For the 4 kg block:

$$F_{\text{net}} = ma \checkmark$$

$$F_g - T = 4 \times 0,75 \checkmark$$

$$4 \times 9,8 \checkmark - T = 4 \times 0,75$$

$$T = 36,20 \text{ N} \checkmark$$

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Please turn over

For the 6 kg block:

Considering horizontal forces only:

$$F_{\text{net}} = ma$$

$$T - F_f = ma$$

$$T - F_f = 6 \times 0,75 \checkmark$$

$$36,20 - F_f = 4,5$$

$$F_f = 31,70 \text{ N} \checkmark$$

(6)

$$3.4 \quad \mu_k = \frac{F_f}{F_N} = \frac{31,70 \checkmark}{6 \times 9,8} = 0,54 \checkmark$$

(3)

- 3.5 Frictional force decreases. ✓ The force F has a vertical component that applies a lifting effect on the 6 kg block. ✓ This reduces the normal force on the block. ✓ (3)

3.6 Remain the same. ✓ (1)

3.7 Increases. ✓✓ (2)

[21]

QUESTION 4

- 4.1 Everybody in the Universe attracts every other body with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. ✓✓ (2)

$$4.2 \quad F = \frac{Gm_1m_2}{d^2} \checkmark$$

$$\frac{6,67 \times 10^{-11} \times 6,0 \times 10^{24} \times 6,39 \times 10^{23}}{(6,37 \times 10^6 + 2,25 \times 10^6 + 3,39 \times 10^5)^2} \checkmark \checkmark$$

$$F = 4,64 \times 10^{21} \text{ N} \checkmark \text{ attractive.}$$

(5)

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4.3 Non contact ✓

(1)

$$4.4 \quad g = \frac{GM}{r^2} \quad \checkmark = \frac{6,67 \times 10^{-11} \times 6,39 \times 10^{23}}{(3,39 \times 10^6)^2} \quad \checkmark \checkmark = 3,71 \text{ m.s}^{-2} \quad \checkmark$$

(4)

$$4.5 \quad 4,64 \times 10^{21} \text{ N}$$

(1)

[13]

Total Marks: 50

✓