LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION
CAPRICORN DISTRICT

NATIONAL
SENIOR CERTIFICATE

GRADE 11

PHYSICAL SCIENCES:
TERM TEST 1
MEMORANDUM
14 MARCH 2016

MARKS: 100

NAME OF SCHOOL: ……………………………………………………………………

This question paper consists of 5 pages, including the cover page

PHYSICAL SCIENCES GRADE 11 MARCH TEST MEMO

QUESTION 1

1.1 A ✓✓
1.2 D✓✓
1.3 C✓✓
1.4 B✓✓
1.5 C✓✓
1.6 C✓✓
1.7 C✓✓
1.8 B✓✓
1.9 A✓✓
1.10 B✓✓   **[2 x 10 = 20]**

QUESTION 2

2.1. When the resultant force acts on an object, the object will accelerate in the direction of the force✓.This acceleration is directly proportional to the force and inversely proportional to the mass of the object. ✓(2)

2.2.

(3)

2.3. $F_{Net} = ma$ ✓

For 5kg block
$T_2 + (mg) + (T_1) = ma$
$250 + [- (5)(9.8)] - T_1$✓$= 5a$ ✓
$a = (201 - T_1)/5$ …………. Equation 1

For 20kg block
$T_1 + (- mg) = ma$✓ …………Equation 2
$T_1 + [-(20)(9.8)] = 20a$✓
$T_1 = 200$ N✓(6)

2.4. Q ✓   (1)

[12]

QUESTION 3

3.1.

(4)
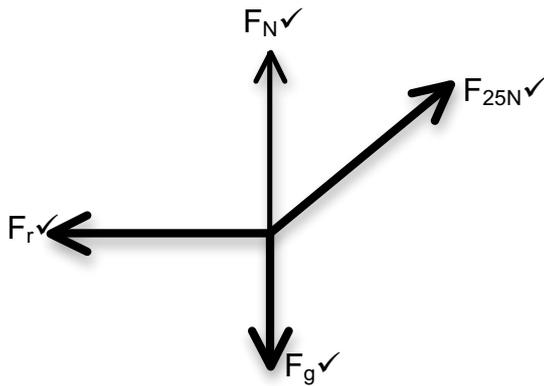
3.2.1. $F_k = F_x$
= F cos Θ ✓
= 25 cos 40^0 ✓
= 19.15 N ✓ (3)

3.2.2. $F_N = F_G - F_Y$
= 50 – 25 sin 40^0 ✓
= 33.93 N ✓ (2)

3.2.3. $F_k = \mu_k F_N$ ✓
  19.15 = μ_k(33.03) ✓
μ_k = 0.56 ✓ (3)

[12]

QUESTION 4

4.1. The track is placed at an angle to compensate for the friction on the track. ✓✓(2)

4.2. directly proportional graph. ✓✓(2)

4.3. Newton's second Law. ✓ When a net force(F_{net}) is applied to an object of mass, m, it accelerates in the direction of the net force. ✓ The acceleration, a, is directly proportional to the net force and inversely proportional to the mass. ✓ (3)

[7]

QUESTION 5

5.1. Between any two objects with mass in the universe a gravitational force exists. This force of attraction is directly proportional to the product of their masses✓ and inversely proportional to the product of their masses and inversely proportional to the square of the distance between their centres✓. (2)

5.2. Weight on earth:
F = mg
=100 x 9.8
=980 N ✓

Weight on new location: 2 x radius of the earth + radius of earth = 3 original

$$F \propto \frac{1}{r^2} \checkmark$$

F = 980 N/ 3^2

980 N/9✓ = 108.9 N✓   (4)

5.3. Weight on earth = 980 N **OR F** = G(m_1 x m_2) / r^2

Planet: mass = 3 x mass of the earth

Radius =(0.5) x radius of the earth= (0.5) x 6.4 x 10^6m

  Planet mass   = 3 x 6 x 10^{24}kg

  Radius =(0.5) x radius of the earth= (0.5) x 6.4 x 10^6m

$$F = 3\checkmark \; x \frac{980}{(\frac{1}{2})^2}\checkmark\checkmark$$

F_{planet} = 11760 N✓

                                                     [10]

QUESTION 6

6.1.1. K^+✓ (1)

6.1.2. O^{2-}✓   (1)

6.2. The valence electrons are the electrons in the highestoccupied energy level of an atom. ✓✓   (2)
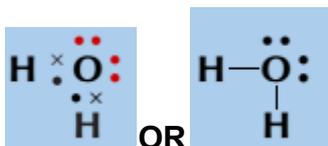
6.3. Mg = 2✓(1)

6.4. Electro negativity of an atom is the ability of the atomin a molecule to attract the bonding electron pair. ✓✓   (2)

6.5.

H ×O: H—O: ✓ for the bonds and ✓ for indicating other
  •×
  H **OR**   H   4 electrons of oxygen   (2)

6.6. BF_3 - is trigonal planar✓, 120^0✓(2)

                                                   [11]

QUESTION 7

7.1. The boiling point of a compound is the temperature at which theVapor pressure of the compound is equal to the atmospheric pressure ✓✓ (2)

7.2. In solid phase : CO_2 ✓ . It sublimes at -72^0C. ✓

Least energy to break intermolecular forces as the compound immediately becomes a gas✓ (sublimation occurs). (3)

7.3. Non- polar✓

Electronegativity S :2.5 ✓

Electronegativity H : 2.1✓

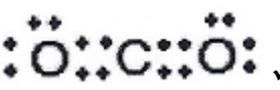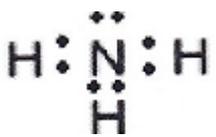Electronegativity = 0.4✓ therefore not a polar molecule (4)

7.4. HI✓ (1)

7.5. Sublimation takes place when a substance change phase directly from a solid to a gas(without forming the liquid phase first) ✓✓(2)
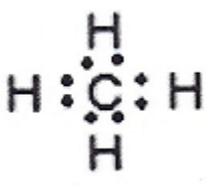
[12]

QUESTION 8

8.1.1.

Carbon dioxide CO_2 ✓ ✓ (2)

Ammonia NH_3 ✓ ✓ (2)

Methane CH_4 ✓ ✓ (2)

8.1.2. Carbon dioxide : Linear ✓(1)

Ammonia : Trigonal pyramidal ✓(1)

Methane : Tetrahedral ✓(1)

8.1.3. Polar. ✓ The N atom is more electronegative than the H atom. ✓ Both dipole moments work in the same direction to give a net dipole moment in the direction of the N atom. ✓ The nitrogen side of the molecule becomes more negative than the hydrogen side✓ and a polar molecule forms. ✓(5)

8.1.4. Ammonia ✓ (1)

8.1.5. Hydrogen bonds ✓✓ (1)

8.2.1. Endothermic reaction ✓(1)

[18]

TOTAL MARKS = 100