GRADE 11 PHYS PRE-TEST MARCH 2016 SEKHUKHUNE DISTRICT

QUESTION 1

1.1. B. ✓✓ (2)

1.2. B. ✓✓ (2)

1.3. D. ✓✓ (2)

1.4. A. ✓✓ (2)

1.5. B. ✓✓ (2)

1.6. C. ✓✓ (2)

1.7. C. ✓✓ (2)

1.8. A ✓✓ (2)

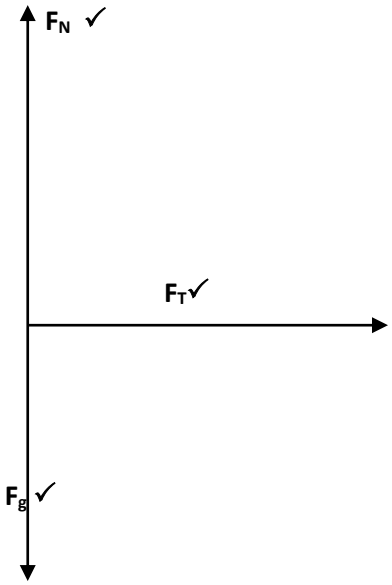
1.9. A. ✓✓ (2)

1.10. C. ✓✓ (2)

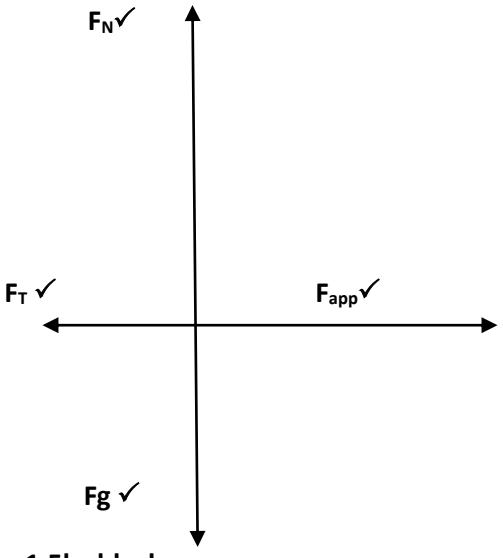
QUESTION 2

2.1 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. ✓ (2)

2.2.1.



0.93kg block



1.5kg block

2.2.2. consider the 0.93kg block

F_{net} = m x a = F_T✓

0.93 x a = F_T ✓..... (1)

Consider the 1.5kg block

F_{net} = m x a = Fapp - F_T✓

1.5 x a✓ = 6.4 - F_T✓**.....(2)**

(2) + (1)

0.93 x a + 1.5 x a = 2.63m·s^{-2}✓

Therefore a = 2.63m·s^{-2}✓

2.2.3. consider the 0.93kg block

F_T = ma✓

F_T = 0.93 = 2.63✓

F_T = 2.45N✓

consider the 1.5kg block

m x a = F_{app} - F_T✓

1.5 x 2.63 = 6.4 - F_T✓

F_T = 2.45N✓

2.2.4. decrease✓

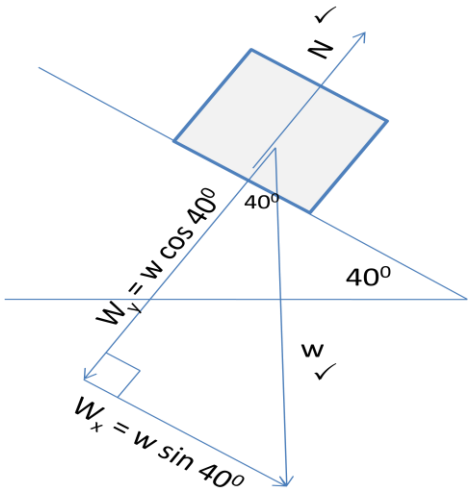
QUESTION 3

3.1. Static friction force : is the frictional force on an object standing still on a surface. ✓

Kinetic friction force: is the frictional force when an object moves with constant velocity over a surface.✓ (2)

3.2. The magnitude of the normal force = w cos Θ, so as the angle of the plane to the horizontal increases cos Θ decreases and so the normal force decreases. ✓ Because friction is proportional to the normal force a decrease in the normal force results in a decrease of friction. ✓ (2)

3.3.1. W = mg = 5 ; 9,8 = 49N; Θ = 40^0



(2)

$W_{parallel} = w \sin \theta$✓

$= (49. \sin 40^0)$✓

= 31,50 N down the plane ✓ (3)

W = 49; Θ = 40^0

$w_{perpendicular} = w \cos \Theta$✓

$= 49 . \cos 40^0$✓

= 37,54 N into the plane✓ (3)

3.3.2. For the block to start moving the component of its weight down the plane must be greater than the maximum static friction. ✓ (1)

N = 37,54 N; $\mu_s = 0,3$; $f_s^{max} = ?$

(The magnitude of N equals the perpendicular component of the weight)

$f_s^{max} = \mu_s . N$✓

$= 0,3 . 37.54$ ✓

= 11,26 N ✓ the block will slide down the plane because f_s^{max} is less than the component of the weight (31,5 N) acting down the slope. (3)

[16]

QUESTION 4

4.1. Tap the hammer with the handle end down. ✓ **the handle of the hammer comes to rest when it hits the floor.** ✓ **but the head continues downwards until a force acts on it to bring it to rest.** ✓ **The force that acts on it, is supplied by the handle, which results in the head being wedgrd more tightly onto the handle,** ✓ **since the metal head is heavy, the wedging it onto the handle is big**✓ **(5)**

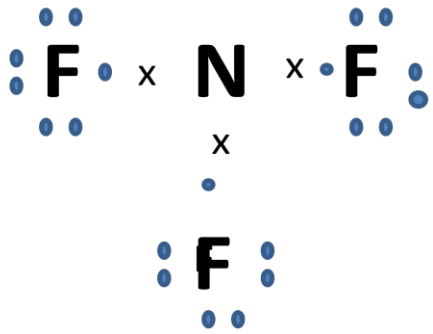
4.2.1. The force felt from contact with the foor or a scale in an accelerating system✓ **For example, the sensation of feeling lighter or heavier in an accelerating elevator.** ✓ **(2)**

4.2.2.If the elevator is moving in a straight line with a constant speed, its acceleration is zero✓ **Now, if the acceleration is zero, the net force must also be zero**✓ **Hence the upwardforce exerted by the floor of the elevator must be equal to the downward force of gravity on you**✓ **As a results, your apparent weight is equal to your weight**✓ **(4)**

[11]

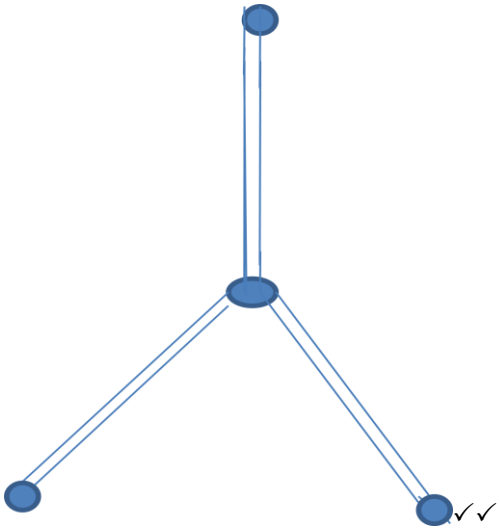
QUESTION 5

5.1. (✓ for N with electrons and ✓ for both F with electrons) (2)



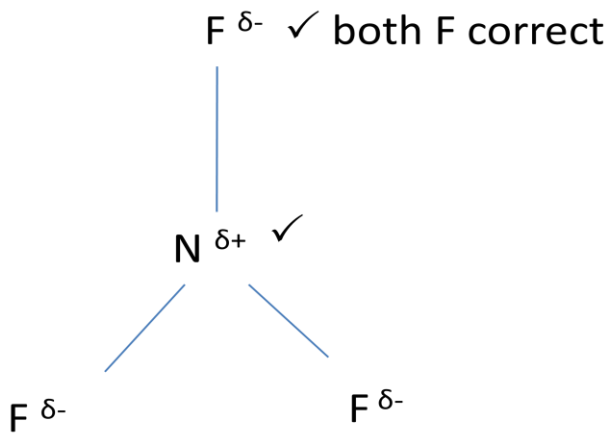
5.2 Three bonding pairs and one lone pair, so four groups ✓ (1)

5.3 Trigonal pyramidal. ✓ (1)



✓✓ (for correct structure) (2)

5.4. Flourine atom is more electronegative, so has δ- charge and nitrogen atom δ+.



(2)

5.5. NF_3 has a polar bond and is asymmetrical. ✓ (1)

[9]

QUESTION 6

6.1.1. 4✓ (1)

6.1.2. -458 $kJ.mol^{-1}$ ✓ (1)

6.1.3. 0,074 nm✓ (1)

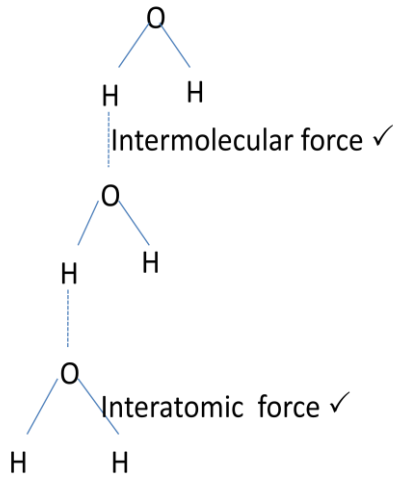
6.1.4. The electro negativity difference between the two atoms is zero. ✓ This means that the electrons are shared equally. ✓ The electrons are shared by the overlapping of the two atomic orbital to form a molecular orbital. ✓ A pure covalent bond forms. ✓ (4)

6.2.1. NH_3 = Dipole-dipole force/ dispersion forces✓ (1)

H_2O = Dipole-dipole force/dispersion forces✓ (1)

HF = Hydrogen bond✓ (1)

6.2.2.



Intermolecular forces is an attraction between molecules. ✓ Interatomic forces is an electrostatic force of attraction between atoms due to sharing or transfer of electrons. ✓ Intermolecular forces are weaker than interatomic forces. (4)

6.2.3. Bent (angular) ✓ (1)

[15]

QUESTION 7

7.1. Ice cubes are less dense than liquid water. Water has a less dense solid phase than solid water. ✓

(1)

7.2. If the ice did not float on top of the water then all bodies of water would freeze from the bottom up. ✓ This would mean that aquatic life would not be able to survive trough the cold winters as there would not be able to survive through the cold winters as there would be no habitat for them. ✓ (2)

7.3. High boiling point and low boiling point. ✓ Water has strong hydrogen bonds between molecules. These bonds require a lot of energy before they will break. This leads to water having a high boiling

point than if there were only weaker dipole-dipole forces. Water also has a high specific heat. ✓ If water did not have such a large range in which it is a liquid, bodies of water would freeze over faster, destroying the life in them. Also if the boiling point of water was lower, then all the water could evaporate on a hot day, which would cause all life to die. ✓ (3)

7.4. Water is able to absorb infrared radiation (heat) from the sun. ✓ This heat energy is stored in the oceans. ✓ Without this effect, the heat from the sum would cause the daytime temperatures on the Earth to become unbearably hot. ✓ (3)

[9]

TOTAL SECTION A [20]

TOTAL SECTION B [80]

GRAND TOTAL [100]