ALEXANDER ROAD HIGH SCHOOL

TERM 1 2020

JA

PHYSICAL SCIENCE CONTROL TEST (PART 2)

60 MIN

TOTAL = 50

GRADE 11

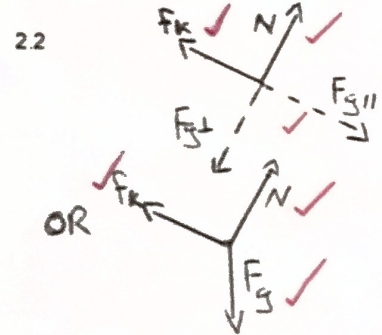**MEMO**

1.1   D ✓✓
1.2   B ✓✓
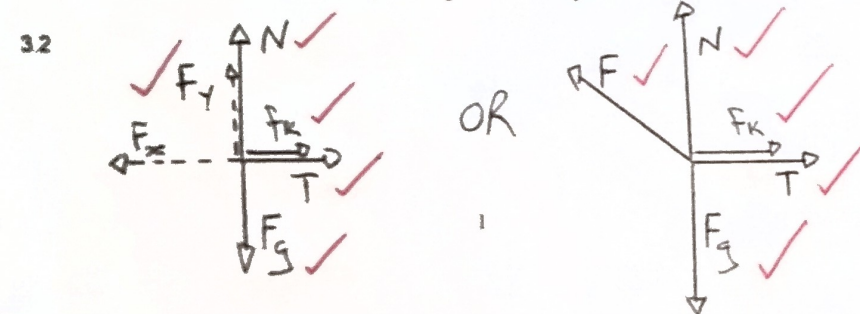1.3   B ✓✓
1.4   A ✓✓
1.5   C ✓✓
16   C ✓✓

2.1   When a resultant/net force acts on an object, the object will accelerate in the direction of the force at an acceleration directly proportional to the force and inversely proportional to the mass of the object. ✓✓ **(2 or 0)**

2.2

2.3.1 $F_{net} = ma$ (either) ✓

$F_{g\parallel} - f_k = ma$

$(6)(9,8)(\sin 25°) - f_k = (6)(6)$ ✓

$\therefore f_k = 11,15\ N$ ✓

2.3.2 $\mu_k = \dfrac{f_k}{N}$ ✓ $N = W_\perp$

$= \dfrac{11,15}{(6)(9,8)(\cos 25°)}$ ✓

$= 0,21$ ✓

3 1   Newton's 3rd Law (of motion). ✓
When object A exerts a force on object B, object B SIMULTANEOUSLY exerts an oppositely directed force of equal magnitude on object A. ✓

3.2

OR

3.3.1   x-direction ~ 5kg   y-direction ~ 3kg

$F_{net} = ma$ (either) ✓ $T - F_g = ma$ ✓

$F_x - T - f_k = ma$ $T - (3)(9,8) = (3)a$ ✓

$(120)(\cos 60°) - T - 5 = (5)a$ ✓ $T = 3a + 29,4$ — ②

$60 - T - 5 = 5a$ — ①

Sub ② into ① : $60 - (3a + 29,4) - 5 = 5a$ ✓

$\therefore a = 3,2\ m.s^{-2}$ left ✓

3.3.2 ✓
$T = 3(3,2) + 29,4$
$\therefore T = 39\ N$ ✓

3.4   DECREASES. ✓
Air resistance decreases the net force (and hence acceleration). ✓

4.1   Each particle in the universe attracts every other particle with a gravitational force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. ✓✓ **(2 or 0)**

4.2 $F = \dfrac{G m_1 m_2}{r^2}$ ✓ $= \dfrac{(6,67 \times 10^{-11})(5,98 \times 10^{24})(1,989 \times 10^{30})}{(1,47 \times 10^9 \times 1000)^2}$ ✓

$\therefore F = 3,67 \times 10^{20}\ N$ attractive ✓

4.3.1   The weight of an object is the (gravitational) force with which earth attracts the object. ✓

4.3.2   SMALLER THAN. ✓

5.1   A covalent bond is the overlapping of half-filled orbitals resulting in the sharing of electrons. ✓✓ **(2 or 0)**

5.2.1   Trigonal planar. ✓
5.2.2   Trigonal pyramidal. ✓
5.2.3   Tetrahedral. ✓
5.2.4   Angular. ✓
5.2.5   Bent. ✓

5.3.1

(must be angular)

5.3.2   Dative covalent bond. ✓

5.4.1   Tetrahedral. ✓
5.4.2   Trigonal planar. ✓