ALEXANDER ROAD HIGH SCHOOL

TERM 1 2020 60 MIN

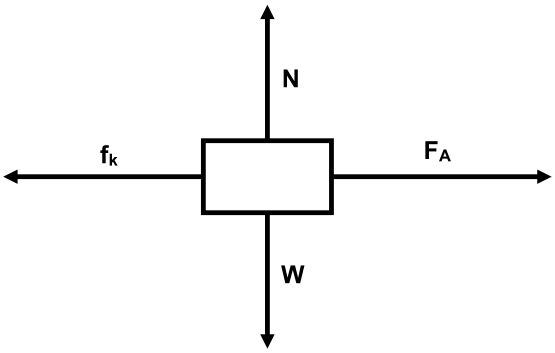
PHYSICAL SCIENCE CONTROL TEST (PART 1) MEMO

JA, PE TOTAL = 50

GRADE 11

1.1 C ✓✓
1.2 C ✓✓
1.3 A ✓✓
1.4 B ✓✓
1.5 D ✓✓ **TOTAL SECTION A: [10]**

2.1 ✓ ✓ ✓ ✓ (one mark per force with correct label)



(4)

2.2 $N = W = m.g = (0{,}5)(9{,}8) = 4{,}9\ N$ ✓

$f_k = \mu_k.N$ ✓formula (if the no substitution into the formula is made: –1 mark)
$(2{,}8)$ ✓$^{f_k = F_A} = \mu_k.(4{,}9)$
$\mu_k = 0{,}57$ ✓answer (if a unit is given: –1 mark)

(4)

2.3.1 Decreases ✓

(1)

2.3.2 The horizontal component of the applied force decreases. ✓

(1)
[10]

3.1 $R^2 = S^2 + T^2$ (Pythag.)
$R^2 = 1576{,}1661^2 + 910^2$ ✓
$R = 1820\ N$ ✓

(2)

3.2 The forces are in equilibrium. ✓

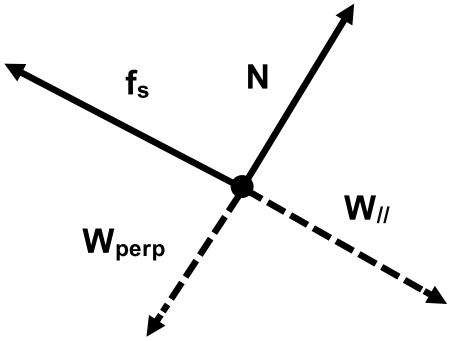
(1)

3.3 $W = mg$ ✓formula
$1820 = m(9{,}8)$ ✓releasing W=R and substitution into formula
$m = 185{,}71\ kg$ ✓answer with unit

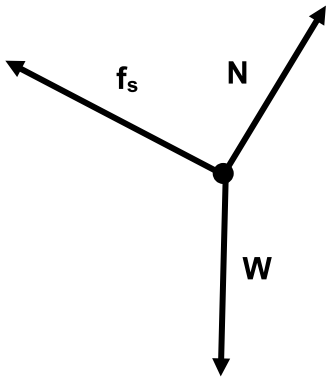
(3)
[6]

4.1 A body will remain in its state of rest or motion at constant velocity unless a non-zero resultant/net force acts on it. ✓✓ *(2 or 0)* (2)

4.2 ✓ ✓ ✓ (one mark per force with correct label)



OR



(3)

4.3.1 $W_{\parallel} = W.\sin(30°) = (630).(9{,}8).\sin(30°) = 3087\ N$ ✓$W_{\parallel}$ (3)

$f_s - W_{\parallel} = 0$ ✓relationship between f_s and $W_{\parallel}$
$f_s = W_{\parallel}$
$f_s = 3087\ N$ ✓answer with unit

4.3.2. $W_{\perp} = W.\cos(30°) = (630).(9{,}8).\cos(30°) = 5346{,}84\ N$ ✓$W_{\perp}$ (4)

$f_s = \mu_s.N$ ✓formula
$4000 = \mu_s.(5346{,}84)$ ✓releasing fs(max)=4000N and substitution into formula
$\mu_s = 0{,}58$ ✓answer

4.4 DECREASES ✓ (1)

[13]

5.1 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)

5.2.1 Mass ✓ (1)

5.2.2 Acceleration ✓ (1)

5.2.3 (Resultant / Applied) Force ✓ (1)

5.3 What is the relationship between the mass of an object and its acceleration? ✓✓ (2)

5.4 $\frac{1}{m}$ ✓ (1)

5.5 $\frac{17 - 10\ ✓}{3{,}3 - 2\ ✓} = 5{,}38\ N$ ✓ (3)

[11]

TOTAL SECTION B: [40]