

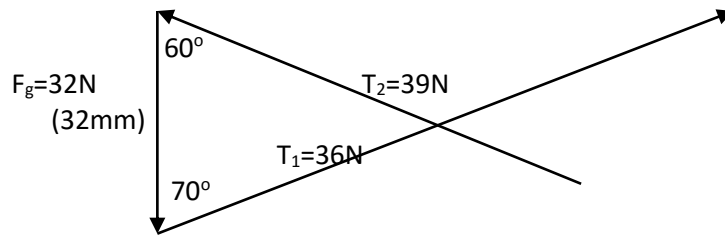
SECTION A

Question 1

- |     |     |      |     |
|-----|-----|------|-----|
| 1.1 | A✓✓ | 1.6  | B✓✓ |
| 1.2 | A✓✓ | 1.7  | B✓✓ |
| 1.3 | C✓✓ | 1.8  | D✓✓ |
| 1.4 | D✓✓ | 1.9  | C✓✓ |
| 1.5 | B✓✓ | 1.10 | D✓✓ |

Question 2

- 2.1 RESULTANT VECTOR – is the single vector that will have the same effect as two or more vectors acting together ✓✓ (2)
- 2.2 ON. ✓ The three forces acting on the block are in equilibrium. ✓ (2)
- 2.3  $F_g = mg$   
 $= 3.265 \times 9.8$   
 $= 32\text{N, downwards}$



Marking Grid

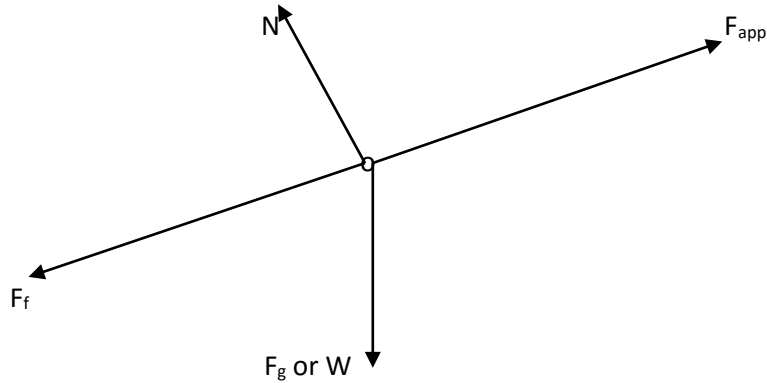
Criteria	Marks
1. Correct calculation of Gravitational Force (Weight)	1
2. Correct measurement of weight according to the scale (32mm)	1
3. Correct measurement of two angles	1
4. Correct measurement of $T_1$ according to scale (36mm)	1
5. Correct measurement of $T_2$ according to scale (39mm)	1
6. $T_1=36\text{N}$ and $T_2=39\text{N}$	1

[10]

Question 3

3.1 NORMAL FORCE – is the force exerted by a surface on an object in contact with it ✓✓ (2)

3.2.1



3.2.2  $F_f + mg \sin \beta = F_{app}$  ✓  
 $F_f = F_{app} - mg \sin \beta$   
 $= 75 - (7.5)(9.8)(\sin 30)$  ✓  
 $= 38.25 \text{ N}$  ✓ (3)

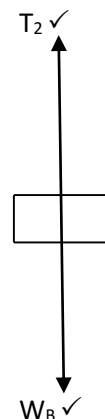
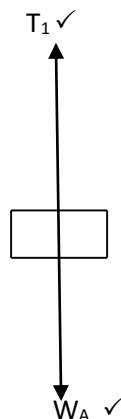
3.2.3  $f_k = \mu_k N$   
 $= \mu_k mg \cos \beta$  ✓  
 $38.25 = \mu_k (7.5) (9.8) \cos 30$  ✓  
 $\mu_k = 0.60$  ✓ (3)

3.2.4 Kinetic friction ✓ – because the block is in motion ✓ (2)  
[14]

Question 4

4.1 Newton's Second Law of motion states that- when a net force,  $F_{net}$ , is applied to an object of mass,  $m$ , it accelerates in the direction of the net force. ✓ That acceleration,  $a$ , is directly proportional to the net force and inversely proportional to the mass ✓ (2)

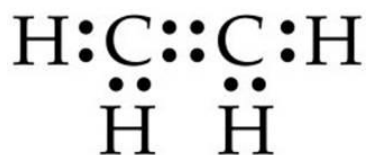
4.2



(4)



6.2.2



(2)

[7]

Question 7

- 7.1 ELECTRONEGATIVITY – is the attracting power an element has for its own bonding electrons OR is a measure of how strongly an atom attracts the shared pair of electrons in a chemical bond. ✓✓ (2)
- 7.2 (a) Fluorine (F), 4.0✓  
 (b) Oxygen (O), 3.5✓  
 (c) Nitrogen (N), 3.0✓  
 (d) Chlorine (Cl), 3.0✓ (4)
- 7.3 (a) Polar Covalent Bond✓ (e) dipole-dipole force✓  
 (b) Ionic Bond✓ (f) Ion dipole force✓  
 (c) Polar Covalent Bond✓ (g) Hydrogen Bonding✓  
 (d) Non Polar Covalent✓ (h) London Forces✓ (4)
- 7.4 CO<sub>2</sub>– the molecule is non-polar because the two oxygen atoms are on either sides of the carbon✓, thus making both ends partially negative✓.  
 CCl<sub>4</sub>– the Cl atoms surround the central C atom and are placed at equal angles✓, making the outer part of the molecule to be partially negative✓. (4)

[18]

Question 8

- 8.1 The boiling points increases as you move down from **B to D**. ✓ (1)
- 8.2 This due to the increase in the strength of the intermolecular forces✓ as you go down. ✓ (2)
- 8.3 The type of the intermolecular force in A (NH<sub>3</sub>) is Hydrogen bonding.✓Hydrogen Bonding is much stronger than the other intermolecular forces✓. So more energy will be required to overcome the hydrogen bonding hence higher boiling point than expected✓ (3)

[6]