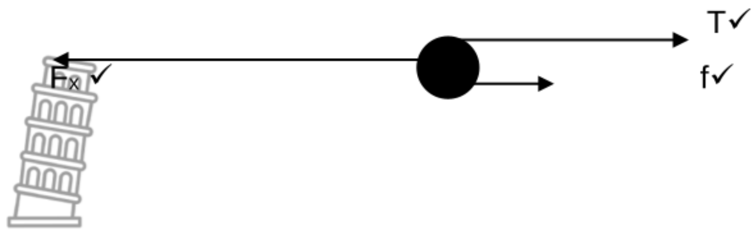
QUESTION 1

1.1	B ✓✓	(2)
1.2	D ✓✓	(2)
1.3	D ✓✓	(2)
1.4	C ✓✓	(2)
1.5	C ✓✓	(2)
1.6	A ✓✓	(2)
1.7	A ✓✓	(2)
1.8	B ✓✓	
		[14]

QUESTION 2

2.1



(3)

2.2

2.2.1 <u>On 3 kg block</u>

$F_{net} = ma$
$T - W = ma$ ✓

$T - (3)(9.8) = (3)(2.2)$ ✓

$T = 36$ N✓ (3)

2.2.2 <u>On 5 kg block</u>

$F_{net} = ma$
$F_x - T - f_k = ma$ ✓

$80\cos 30°$ ✓ $- 36 - \mu_k(5 \times 9.8 + 80\sin 30°)$ ✓ $= 5(2.2)$ ✓

$\mu_k = 0.25$✓ (5)

2.3

2.31 Increase ✓

According to ($f_k = \mu_k N$), at a constant coefficient of kinetic friction, kinetic frictional force increases as <u>normal forces increases</u>. ✓ (2)

OR

Increase ✓

Normal force is directly proportional to kinetic frictional force. ✓

2.3.2 Remain the same. ✓
Coefficient of kinetic friction depend on the nature of the surface only. ✓ (2)

[15]

QUESTION 3

3.1 An object which has been given an initial velocity and then it moves under the influence of gravitational force only. ✓✓ (2)

3.2

3.2.1

OPTION 1	**OPTION 2**
upwards as positive	**downwards as positive**
$V_f^2 = V_i^2 + 2a\Delta y$ ✓	$V_f^2 = V_i^2 + 2a\Delta y$ ✓
$= (-10)^2 + 2(-9,8)(-13)$ ✓	$= (10)^2 + 2(9,8)(13)$ ✓
$= 18,84\ m.s^{-1}$ downwards ✓	$= 18,84\ m.s^{-1}$ downwards ✓

(3)

3.2.2 **POSITIVE MARKING FROM QUESTION 3.2.1**

OPTION 1	**OPTION 2**
downwards as positive	upwards as positive
$F_{net}\Delta t = \Delta p$ $F_{net}\Delta t = m(v_f - v_i)$ ✓	$F_{net}\Delta t = \Delta p$ $F_{net}\Delta t = m(v_f - v_i)$ ✓
$F_{net}(0,3) = 200\times10^{-3}(-24 - 18,84)$ ✓✓	$F_{net}(0,3) = 200\times10^{-3}(24 - (-18,84))$ ✓✓
$F_{net} = -28,56\ N$	
$F_{net} = 28,56\ N$ ✓	$F_{net} = 28,56\ N$ ✓

(4)

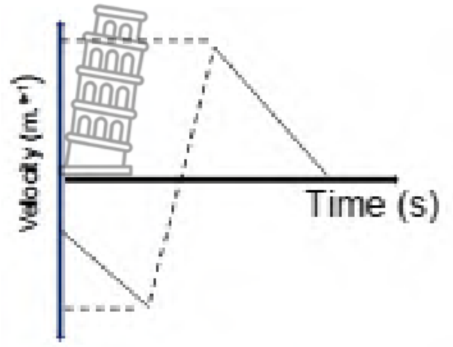
3.3

OPTION 1	**OPTION 2**
upwards as positive	**downwards as positive**
For ball A	**For ball A**
$\Delta y = V_i\Delta t + \frac{1}{2}a\Delta t^2$ ✓	$\Delta y = V_i\Delta t + \frac{1}{2}a\Delta t^2$ ✓
$\Delta y = 0 + \frac{1}{2}(-9,8)\Delta t^2$ ✓ **…. (1)**	$-\Delta y = 0 + \frac{1}{2}\{+(9,8)\Delta t^2$ ✓ …. (1)
For ball B	**For ball B**
$\Delta y = V_i\Delta t + \frac{1}{2}a\Delta t^2$	$y = V_i\Delta t + \frac{1}{2}a\Delta t^2$
$-[(30-2) - \Delta y] = -15\Delta t + \frac{1}{2}(-9,8)\Delta t^2$ ✓✓ **…. (2)**	$[(30-2) - \Delta y] = 15\Delta t + \frac{1}{2}(9,8)\Delta t^2$ ✓✓ ...(2)
(1) Into (2)	(1) Into (2)
$t = 1,87\ s$ ✓	$t = 1,87\ s$ ✓

(5)

3.4 **OPTION 1**

upwards as positive

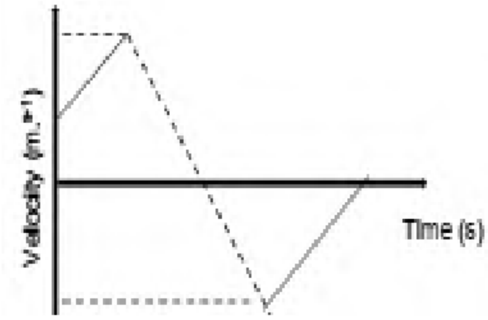


shape : ✓

label both axis : ✓

OPTION 2

Downwards as positive



shape : ✓

label both axis : ✓

(2)

[16]

QUESTION 4

4.1 The total linear momentum of an isolated system remains constant. ✓✓ (2)

4.2 $\Sigma p_i = \Sigma p_f$

$m_c v_{ic} + m_t v_{it} = m_c v_{fc} + m_t v_{ft}$ ✓

$(1500)(-20) + (2600)(16)$ ✓ $= (1500)(5,2) + (2600)\, v_{ft}$ ✓

$v_{ft} = 1,46\ m.s^{-1}$ easwards. ✓ (4)

4.3 Inealstic ✓

POSITIVE MARKING FROM QUESTION 4.2

$\Sigma Ek_{before} = \frac{1}{2} m_c v^2_{ic} + \frac{1}{2} m_t v^2_{it}$ ✓

$= \frac{1}{2}(1500)(20)^2 + \frac{1}{2}(2600)(16)^2$ ✓

$= 622800\ J$

$\Sigma E_{kafter} = \frac{1}{2} m_c v^2_{fc} + \frac{1}{2} m_t v^2_{ft}$

$= \frac{1}{2}(1500)(5,2)^2 + \frac{1}{2}(2600)(1,46)^2$ ✓

$= 23051\ J$

$\Sigma Ek_{before} \neq \Sigma E_{kafter}$ ✓ (5)

4.4 Car ✓

It experiences a greater acceleration OR It has a greater change in velocity ✓ (2)

[13]

QUESTION 5

5.1 Organic molecules. ✓ (1)

5.2

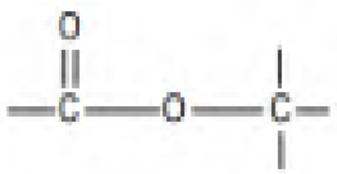
5.2.1 C✓ (1)

5.2.2 F✓ (1)

5.2.3 B✓ (1)

5.2.4 D✓ (1)

5.2.5 E✓ (1)

5.3.1  ✓✓ (2)

5.3.2 Propanol ✓✓ (2)

5.4

4 – bromo✓–2,2 – di✓methyl pe✓ntane (3)

5.5 Primary alcohol. ✓

The carbon atom bonded to the hydroxyl (-OH) group is directly bonded to only one other carbon atom. ✓

(2)

5.6 $2C_2H_6 + 7O_2$ ✓ $\longrightarrow$ $4CO_2 + 6H_2O$ ✓ ✓ balancing. (3)

[18]

QUESTION 6

6.1 The temperature at which the vapour pressure ✓ of a substance equals the atmospheric pressure. ✓ (2)

6.2

6.2.1 Number of carbons/ chain length. ✓ (1)

6.2.2 What is the relationship between the number of carbon atoms/ chain length and the boiling point? ✓✓ (2)

6.2.3 As the number of carbon atoms / chain length increases, the boiling point also increases. ✓ ✓ (2)

6.3
- Alkanes have London forces. ✓
- Alcohols have London forces Dipole-dipole forces and hydrogen bonds. ✓ (4)
- The intermolecular forces of alcohols are stronger than those of alkanes.✓
- More energy needed to overcome the intermolecular forces of alcohols. ✓

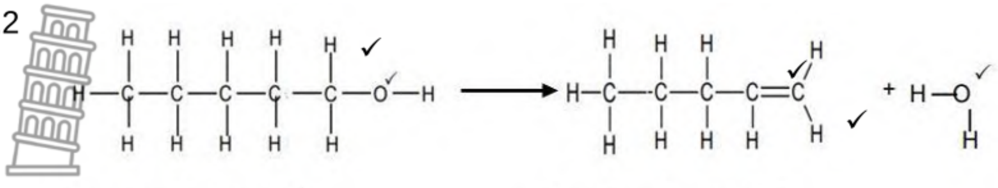
[11]

QUESTION 7

7.1

7.1.1 Elimination ✓ (1)

7.1.2



Functional group: ✓ Functional group: ✓

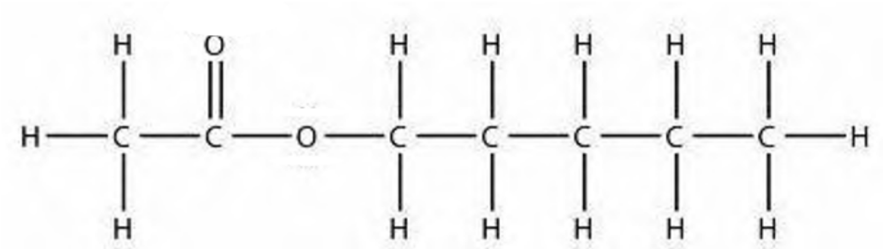
Whole structure correct: ✓ Whole structure: ✓ (5)

Water ✓

7.2

7.2.1 Esterification ✓ (1)

7.2.2



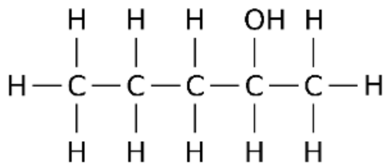
✓ functional group ✓ structure (2)

7.3

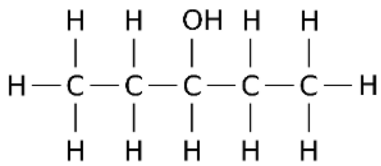
7.3.1 Substitution ✓ (1)

7.3.2 1-bromopentane ✓✓ (2)

7.4



✓



✓ (2)

[14]

TOTAL [100]