Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Physical 1

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Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) $CH_2OHCH(OH)CH_2OH$ **1**

(Potassium) Carboxylate salt
Allow fatty acid salt / salt
Salt of a carboxylic acid **1**

Soap
Allow detergent / surfactant **1**

(b) 638 = 173 + 3(15 + 14n)
M_r ester fragment = 173 **M1**

Show subtract 638 – (M1 + 45) **M2**

Division of M2 by 42
n = 10
n must be an integer **M3**

(c) Amount HCl = 0.100 × 0.01565 = 1.565 $\times 10^{-3}$ mol **M1**

Initial amount KOH = $\frac{0.421}{56.1}$ = 7.50 $\times 10^{-3}$ mol **M2**

Amount KOH used = M2 – M1 = 5.939 $\times 10^{-3}$ mol **M3**

Amount ester = $\frac{5.935 \times 10^{-3}}{3}$ = 1.980 $\times 10^{-3}$ mol (M3 / 3) **M4**

Mass ester = (1.980 $\times 10^{-3}$) × 638 = 1.263 g (M4 x 638) **M5**

%age by mass = $\frac{1.263}{1.45}$ × 100 = 87.1 % ((M5 / 1.45) x 100)
Allow 87.0 to 87.1
Allow 2 sf
Don't allow M6 for an answer >100%

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M6

(d) Allow to dissolve both oil and KOH

*To act as a mutual solvent **OR** To ensure reactants are miscible*

M1

Precaution must be linked to heating
e.g. Use a water bath for heating mixture

Allow electrical heater / mantle

Allow sand bath

M2

Prevents risk of fire / Ethanol is flammable

Allow KOH is corrosive/caustic/damages eyes if matches alternative precaution given

M3

[15]

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Q2.

(a) **M1** $n(S_2O_3^{2-}) = 33.50 \times 0.100 \div 1000 = \underline{0.00335}$

1

M2 $n(I_2) = 0.00335 \div \mathbf{2} = 0.001675$ (from eqn 2)

M2 = ***M1***÷*2*

1

M3 $n(ClO^-)$ in 25 cm^3 pipette = 0.001675 (from eqn 1)

M3 = ***M2***

1

M4 $n(ClO^-)$ in 100 cm^3 flask = 0.001675 **x 4** = 0.00670 = n(NaClO) in original 10 cm^3 sample

M4 = ***M3*** *x 4*

1

M5 mass (NaClO) = 0.00670 x 74.5 = 0.499 g

M5 = ***M4*** *x 74.5*

1

M6 mass (bleach) = 10.0 x 1.20 = 12 g

M6 = *mass of bleach*

1

M7 % by mass of NaClO = $\frac{0.499}{12}$ = 4.16 %

M7 = (***M5***÷***M6***) *x 100 to 3 significant figures*
Allow 4.15% to 4.17%

1

(b) 0.45%

1

[8]

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