

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Mark Schemes

Q1.

- (a) Amount of propanone = $(25.0 \times 1) / 1000 = 0.025 \text{ mol}$

1

Concentration in mixture **A** = $0.025 / (90.0/1000) = 0.278 \text{ mol dm}^{-3}$

1

- (b) To make volumes constant for all mixtures.

1

So that volume of propanone is proportional to concentration.

1

- (c) Amount of iodine in mixture **E** = $(40.0 \times 0.02) / 1000 = 8.0 \times 10^{-4} \text{ mol}$

1

Amount of iodine in sample = $8.0 \times 10^{-4} \times (10 / 90) = 8.89 \times 10^{-5} \text{ mol}$

As 10 cm^3 sample taken from total volume of 90 cm^3

1

Amount of thio required = $2 \times 8.89 \times 10^{-5} = 1.78 \times 10^{-4} \text{ mol}$

1

Volume of thio = $(1.78 \times 10^{-4} / 0.01) \times 1000 = 17.8 \text{ cm}^3$

1

- (d) Scale

Graph must cover at least half the grid and axes must be plotted in correct orientation but ignore labeling.

1

Points

Must be correctly plotted to within $\pm$ half a small square.

1

Best-fit straight line

*Must be the best-fit line possible if point(s) are plotted incorrectly.
Penalise doubled or kinked lines.*

1

Gradient = y / x

1

= -0.060

*Allow -0.059 to -0.061
Ignore any units given.*

1

- (e) Gradients / rates are proportional to volumes / concentrations of propanone **or** B to D show that gradient / rate halves when vol / concentration halves.

1

So first order with regard to propanone.

1

- (f) To stop / quench the reaction at that time.

Ignore NaHCO_3 reacts with the HI produced.

1

By removing the acid catalyst for the reaction (by neutralisation).

1

[17]