

Name of the Student: \_\_\_\_\_

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

(a)  $\frac{[Y][H_2O]^2}{[X][CH_3OH]^2}$

1

(b) 0.06

1

0.32

1

0.52

1

(c)  $\frac{0.26 \times 0.52^2}{0.06 \times 0.32^2}$

1

= (11.44) = 11 (2 sf)

1

No units

1

(d) Increase

1

**[8]**

Q2.

- (a) amount of X =  $0.50 - 0.20 = 0.30$  (mol) 1
- amount of Y =  $0.50 - 2 \times 0.20 = 0.10$  (mol) 1
- (b) Axes labelled with values, units and scales that use over half of each axis  
*All three of values, units and scales are required for the mark* 1
- Curve starts at origin 1
- Then flattens at 30 seconds at 0.20 mol 1
- (c) Expression =  $K_c = \frac{[Z]}{[X][Y]^2}$  1
- $[Y]^2 = \frac{[Z]}{[X] K_c}$  1
- $[Y] = (0.35 / 0.40 \times 2.9)^{0.5} = 0.5493 = 0.55$  (mol dm<sup>-3</sup>)  
*Answer must be to 2 significant figures* 1
- (d) Darkened / went more orange 1
- The equilibrium moved to the right 1
- To oppose the increased concentration of Y 1
- (e) The orange colour would fade 1

[12]