Question number	Answer	Additional guidance	Marks
7(a)	B		**1**
7(b)(i)	• calculation of n(CO) at equilibrium and $n(H_2)$ at equilibrium (1) • converting number of moles to concentration (1) • evaluation of K_c by substitution (1) • correct answer to 3 sf (1) • units: $dm^6\ mol^{-2}$ (1)	Example of calculation n(CO) at equilibrium = 0.114 (mol) $n(H_2)$ at equilibrium = 0.228 (mol) $[CO] = 0.0950\ moldm^{-3}$, $[H_2] = 0.190\ moldm^{-3}$, $[CH_3OH] = 0.0717\ mol\ dm^{-3}$ $K_c = 0.0717 \div (0.0950 \times 0.190^2) = 20.9068\ldots..$ $= 20.9\ dm^6\ mol^{-2}$ Allow $mol^{-2}\ dm^6$ 3rd and 4th marks csq on answers given in 1st and 2nd marks Correct final answer to 3 sf with units but no working scores 5 marks	**5**
7(b)(ii)	An explanation that makes reference to the following points: • an increase in temperature shifts the equilibrium to the left (1) • an increase in pressure shifts the equilibrium to the right (1) • these changes produce opposing effects, so to predict the effect on the yield it is necessary to know the relative effects of each one (1)		**3**

(Total for Question 7 = 9 marks)