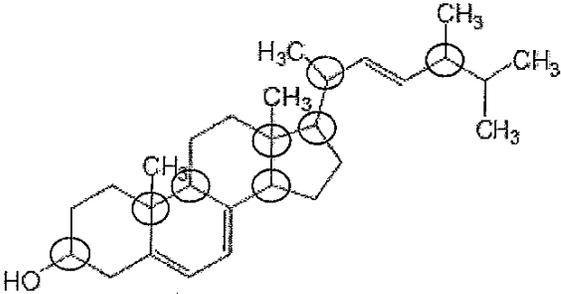
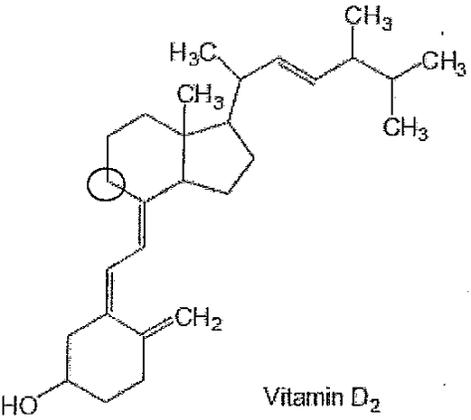


Question 2		Answer	Marks
(a)		Ergosterol	3
(b)		Vitamin D ₂	2
(c)	Zero		1
(d)	In 40 min, (42-7) µg/g dry mushroom of vitamin D ₂ produced $(42-7)/40 = 0.875 \mu\text{g}(\text{g dry mushroom})^{-1}\text{min}^{-1}$ $\therefore k = 0.0146 \mu\text{g}(\text{g dry mushroom})^{-1}\text{s}^{-1}$ <i>(1 mark for the value of k, and 1 mark for the correct units)</i>		2
(e)	In 40 min, (14-3) µg/g dry mushroom of vitamin D ₂ produced \therefore In 60 min, $((14-3) \times 60/40) + 3 = 19.5 \mu\text{g/g dry mushroom}$ In 10g of dry mushrooms, $19.5 \times 10 = 195 \mu\text{g}$ of vitamin D ₂		1
(f)	At 25 °C, $k_{(T)} = A \times e^{(-E_a / (8.314 \times 298))}$ At 35 °C, $2k_{(T)} = A \times e^{(-E_a / (8.314 \times 308))}$ $e^{(-E_a / (8.314 \times 308))} = 2 \times e^{(-E_a / (8.314 \times 298))}$ $-E_a / (8.314 \times 308) = \log_2 2 - E_a / (8.314 \times 298)$ $0.0004036 E_a - 0.0003905 E_a = 0.693$ $0.0000131 E_a = 0.693$ $E_a = 53 \text{ kJ mol}^{-1}$		2

Note: Tests are to be taken under controlled conditions. Students must not have access to the information contained in this marking scheme prior to, or during, the test.