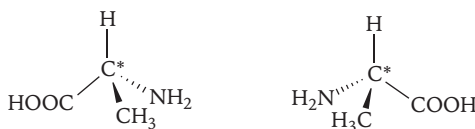


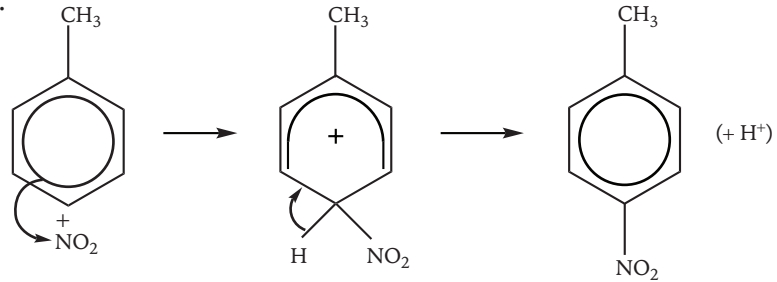
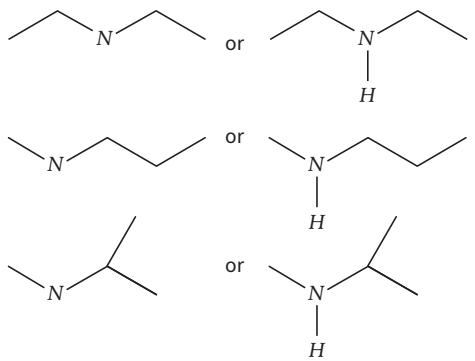
A Level OCR Chemistry

Chapter 23 – answers

Question	Answers	Extra information	Mark	AO Spec reference
1(a)(i)	Molecules with the same structure/structural formula But with bonds/atoms arranged differently in (3D) space		1 1	4.1.3
1(a)(ii)	Two compounds which have the same chemical formula but different spatial arrangement of atoms, and are non super-imposable mirror images of each other.		1	6.2.2
1(a)(iii)		Either enantiomer is acceptable. Must use dots and wedges. Chiral carbon must have an asterisk for M2.	2	6.2.2, M4.2, M4.3
1(b)(i)	2-aminopropanoic acid		1	4.1.1
1(b)(ii)	RCH(NH ₂)COOH	Accept CH ₃ CH(NH ₂)COOH	1	6.2.2
1(c)(i)	Nitrogen lone pair can accept a proton (to form a salt)		1	6.2.1
1(c)(ii)	CH ₃ CH(NH ₂)COOH + HCl → CH ₃ CH(NH ₄ ⁺)COOH + Cl ⁻	Both sides of the equation need to be correct for the mark. Ignore state symbols	1	6.2.1
2(a)	CH ₃ Br OR CH ₃ Cl AND FeBr ₃ OR FeCl ₃ OR Fe OR AlBr ₃ OR AlCl ₃	Either answer and its corresponding halogen carrier is acceptable	1	6.1.1
2(b)	Electrophilic substitution		1	6.1.1

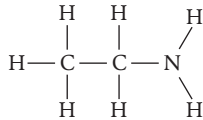
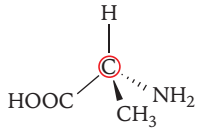
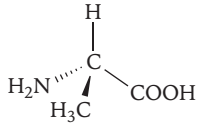
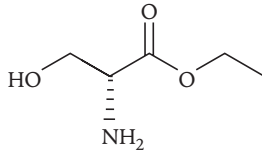
A Level OCR Chemistry

Chapter 23 – answers

Question	Answers	Extra information	Mark	AO Spec reference
2(c)	Reagents: (Conc) H_2SO_4 , AND (conc) HNO_3 Mechanism: 	Both needed for the mark Must show delocalisation over half the ring in the intermediate	1 1 1 1	6.1.1, 6.2.1
2(d)	Sn AND conc HCl		1 1	6.2.1
2(e)	Reduction		1	6.2.1
3(a)			1 1 1	6.2.2, M4.1, M4.2
3(b)(i)	1 peak		1	6.3.2
3(b)(ii)	As all hydrogens are in the same environment.		1	6.3.2

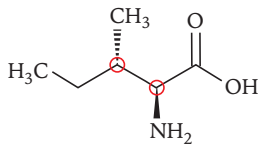
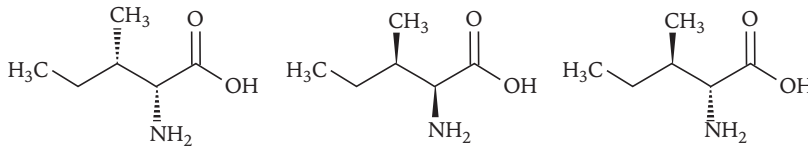
A Level OCR Chemistry

Chapter 23 – answers

Question	Answers	Extra information	Mark	AO Spec reference
3(c)(i)			1	6.2.2, 6.2.3,
3(c)(ii)	Ethylamine		1	4.1.1
4(a)			1	6.2.2, M4.2, M4.3
4(b)(i)		Check that this is not the same isomer drawn rotated	1	6.2.2, M4.2, M4.3
4(b)(ii)	Two compounds which have the same chemical formula but different spatial arrangement of atoms, and are non super-imposable mirror images of each other .		1 1	6.2.2
4(c)(i)	$\text{HOCH}_2\text{CH}(\text{NH}_2)\text{COOH} + \text{NaOH} \rightarrow \text{HOCH}_2\text{CH}(\text{NH}_2)\text{COO}^-\text{Na}^+ + \text{H}_2\text{O}$	Serine can be shown as $\text{C}_3\text{H}_7\text{NO}_3$	1	6.2.1
4(c)(ii)	$\text{HOCH}_2\text{CH}(\text{NH}_2)\text{COOH} + \text{CH}_3\text{OH} \rightarrow \text{HOCH}_2\text{CH}(\text{NH}_2)\text{COOCH}_3 + \text{H}_2\text{O}$		1	6.2.2
4(c)(iii)		–COO– functional group must be shown clearly	1	6.2.2, 6.1.3, M4.2
5(a)(i)	$\text{RCH}(\text{NH}_2)\text{COOH}$		1	6.2.2, M4.2, M4.3

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Chapter 23 – answers

Question	Answers	Extra information	Mark	AO Spec reference
5(a)(ii)		Either chiral centre can be circled.	1	6.2.3, M4.2, M4.3
5(a)(iii)		Make sure there are no repeats of structures	1 1 1	6.2.2
5(b)	$\text{RCH}(\text{NH}_2)\text{COOH} + \text{HA} \rightarrow \text{RCH}(\text{NH}_3^+)\text{COOH} + \text{A}^-$		1	6.2.2
6(a)(i)	$(\text{C}_2\text{H}_5\text{NH}_3^+)_2\text{SO}_4^{2-}$	Compounds can be written without charges	1	6.2.2
6(a)(ii)	$\text{C}_2\text{H}_5\text{NH}_3^+ + \text{CH}_3\text{COO}^-$	Compounds can be written without charges	1	6.2.2
6(b)(i)	Excess ethanolic ammonia/ concentrated solution of ammonia in ethanol		1	6.2.1
6(b)(ii)	Nucleophilic substitution		1	6.2.1
6(b)(iii)	KCN/NaCN in ethanol	Either KCN or NaCN	1	6.2.4
6(b)(iv)	H_2 with Ni catalyst		1	6.2.4

Skills box answers:

- a) As $[\text{H}^+]$ \uparrow , pH \downarrow
 b) As $p(\text{H}_2)$ \uparrow , K_p \downarrow
 c) As $p(\text{H}_2)$ \uparrow , K_p \uparrow
 d) As $[\text{H}^+]$ \uparrow , rate \uparrow
 e) As $[\text{H}^+]$ \uparrow (from 0 to 0.5), K_a \uparrow