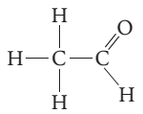
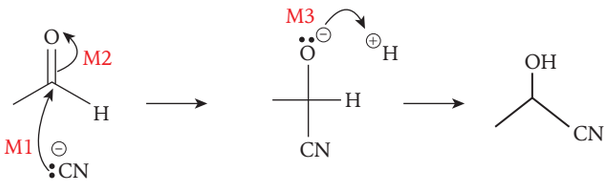
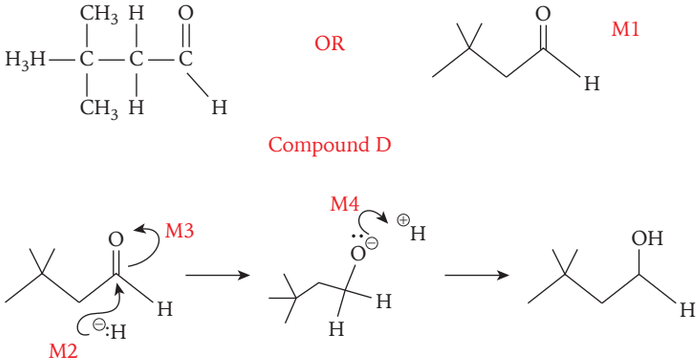
A Level OCR Chemistry

Chapter 21 – answers

Question	Answers	Extra information	Mark	AO Spec reference
1(a)(i)		Must show double bond to carbon and single bond to hydrogen.	1	4.1.1, M4.2
1(a)(ii)			1 1 1	6.1.2
1(b)	Add Tollens reagent, and warm gently for a few minutes Ketone: no change in the colourless solution Aldehyde: colourless solution produces a grey precipitate of silver/silver mirror is produced on the test tube.		1 1 1	6.1.2
2(a)(i)			1 1 1	6.1.2, M4.2
2(a)(ii)	3,3-dimethylbutan-1-ol		1	4.1.1
2(a)(iii)	4		1	6.3.2

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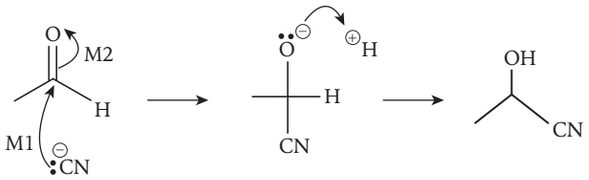
2(b)	Reagent: Tollens reagent, and warm gently for a few minutes Ketone: no change in the colourless solution Aldehyde: colourless solution produces a grey precipitate of silver/silver mirror is produced on the test tube.		1 1 1	6.1.2
3(a)(i)	Nucleophile	Accept electron pair donor	1	6.1.2
3(a)(ii)		**1** mark per curly arrow	3	6.1.2
3(a)(iii)	Nucleophilic addition		1	6.1.2
3(b)	The product formed is a racemic mixture /containing equal parts of each optical isomer		1 1	6.1.2
4(a)	Same chemical formula but a different arrangement of atoms		1	4.1.1
4(b)(i)	(P will have a ketone carbonyl peak at) 1680-1750 (cm^{-1})		1	4.2.4
4(b)(ii)	(Q will have an alcohol peak at) 3230 – 3550 (cm^{-1})	Allow (Q will have an alcohol peak at) 1000 – 1300 (cm^{-1})	1	4.2.4
4(c)(i)	P		1	6.1.2

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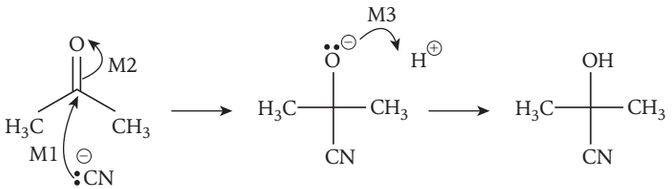
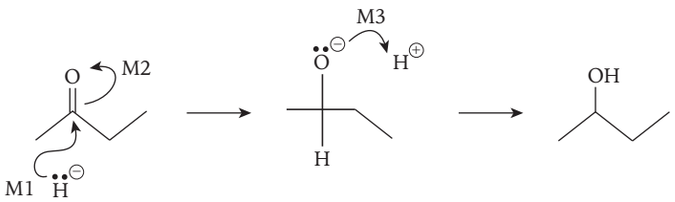
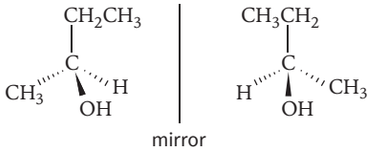
4(c)(ii)	 (M4 = for name: AVC . add –) Name of mechanism: Nucleophilic additon		1 1 1 1	6.1.2
5(a)	(Compounds which are) non-superimposable mirror images		1	6.1.2, 6.2.2
5(c)(i)		1 mark for each curly arrow. Only need to show the nuclephile as [H^-].	3	6.1.2
5(c)(ii)		Must show at least one wedge/ dashed line. Need to show the mirror, or similar, to show how they are related for second mark.	1 1	6.1.2, M4.1, M4.2
5(c)(iii)	Butan-2-ol		1	4.1.1
6(a)(i)	3-hydroxybutan-2-one	Accept 3-hydroxybutanone	1	4.1.1
6(a)(ii)	4		1	6.3.2
6(a)(iii)	4		1	6.3.2
6(b)(i)	Solution would turn green		1	4.2.1, 6.1.2

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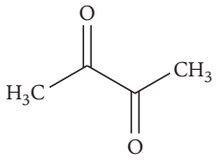
6(b)(ii)	Oxidation		1	4.2.1, 6.1.2
6(b)(iii)			1	4.2.1, 6.1.2, M4.2
6(b)(iv)	Lose –OH peak at 3200 – 3600 cm^{-1} Would still see C=O (carbonyl) peak at 1630 – 1820 cm^{-1}		1 1	4.2.4

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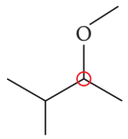
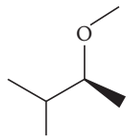
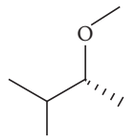
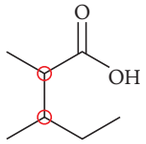
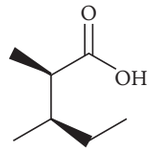
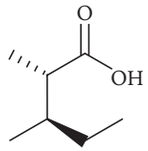
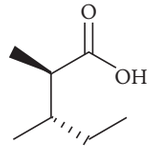
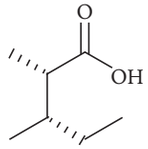
Skills boxes answers

Answers: Chiral centres shown in red

1		 
2		   
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