A-Level Chemistry: **w25 11**

Question 33 (Answer: **A**)

- Count the oxygens: three [O] used and one water released tells you how far the oxidation goes.
- A primary alcohol to an aldehyde uses one [O] and releases one water; the aldehyde to the acid uses another [O] with no water.
- Only the structure that takes exactly three [O] while losing exactly one water fits.

Question 39 (Answer: **B**)

- For $C_xH_yO_z$ the oxygen needed for complete combustion is $x + y/4 - z/2$.
- 8.5 mol fits $C_6H_{12}O$ $(6 + 3 - 0.5)$, so that is X's molecular formula.
- Of the candidates, only those that resist acidified $KMnO_4$ – a tertiary alcohol or a ketone – qualify.

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Question 32 (Answer: **C**)

- $LiAlH_4$ reduces a carboxylic acid all the way to a primary alcohol.
- $NaBH_4$ on propanone gives a secondary alcohol, and steam on propene gives propan-2-ol, also secondary.
- Hot concentrated acidified $KMnO_4$ cleaves ethene's double bond rather than making an alcohol.

Question 35 (Answer: **B**)

- 2,4-DNPH gives an orange precipitate with any aldehyde or ketone.
- Alkaline iodine gives a yellow precipitate only for a CH_3CO– group, or a $CH_3CH(OH)$– that oxidises into one.
- So compare which of those fragments Q already has, and which appear only after the oxidation.

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Question 33 (Answer: **A**)

- Step 1 removes water from the alcohol to give cyclohexene – a dehydration.
- Step 2 adds two OH groups across that C=C using cold dilute manganate(VII) – an oxidation.
- Neither step is a reduction or a substitution.

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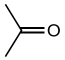
3(a)(i)	
3(a)(ii)	yellow precipitate
3(a)(iii)	elimination

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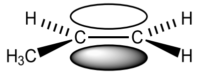
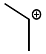
3(a)(iv)	
3(b)(i)	$(CH_3)_2CHOH + Na \rightarrow (CH_3)_2CHO^{(-)}Na^{(+)} + \frac{1}{2}H_2$
3(b)(ii)	**M1** correct dipole on $^{\delta+}C$—$Br^{\delta-}$ **AND** curly arrow from C—Br bond to Br **M2** intermediate  **M3** curly arrow from lone pair of $(CH_3)_2CHO^-$ to C^+
3(b)(iii)	**M1** rate would decrease **M2** C—Br is weaker (than C—C*l*, so breaks more easily)
3(b)(iv)	$C_6H_{14}O + 9O_2 \rightarrow 6CO_2 + 7H_2O$