

Q	n	Answer	Marks	Guidance
1		Empirical formula Mole Ratio C : H : O = 5.88 : 5.92 : 1.47 ✓ Empirical formula = C₄H₄O ✓ Molecular formula Molecular formula = C₈H₈O₂ AND Evidence of 136 in working or from labelled peak in spectrum ✓	3	ANNOTATE ANSWER WITH TICKS AND CROSSES ALLOW $\frac{70.58}{12.0} : \frac{5.92}{1.0} : \frac{23.50}{16.0}$ ALLOW 4:4:1 if linked to C:H:O Alternative method for 3 marks: C: $\frac{136 \times 70.58/100}{12.0} = 8$ H: $\frac{136 \times 5.92/100}{1.0} = 8$ O: $\frac{136 \times 23.50/100}{16.0} = 2$

Question	Answer	Marks	Guidance
2	B	1	

Question	Answer	Marks	Guidance
3	C	1	

Question			Answer	Marks	AO element	Guidance
4			C=C/alkene peak in region $1620-1680\text{ cm}^{-1}$ ✓ O-H/alcohol peak in region $3200-3600\text{ cm}^{-1}$ ✓	2	3.2×2	LOOK ON THE SPECTRUM for labelled peaks which can be given credit IGNORE references to C-O at 1000cm^{-1}

Question	Answer	Marks	AO element	Guidance
5	D	1	AO2.5	

Question	Answer	Marks	AO element	Guidance
6	B	1	AO2.1	

Question	Answer	Marks	AO	Guidance
7	B	1	AO1.1	

Question	Answer	Marks	AO	Guidance
8	B	1	AO2.5	

Question	Answer	Marks	Guidance
9	B	1	AO2.1

Question	Answer	Marks		Guidance
10	C	1	AO2.1	

Question	Answer	Marks	Guidance
11	A	1	

Question	Answer	Marks	Guidance
12	D	1	

Question	Answer	Marks	Guidance
13	A	1	

Question	Answer	Marks	Guidance
14	A	1	