Edexcel AS Chemistry Exam practice answers

7: Modern analytical techniques

1 (a) (i) *m/z* = 124 is caused by (C3H781Br)+;(✓) that at 122 by (C3H779Br)+; (✓) and at 29 by (C2H5)+ (✓)

 (ii) There is no 80Br isotope (✓)

 (iii) CH3CH2CH2Br (✓)

 (iv) About equal (✓)

 (b) A (✓)

 (c) B (✓)

 (d) C (✓)

2 (a) (i) Peak at 3333¦cm−1 is due to O–H; (✓) that at 2963¦cm−1 due to an alkane C–H (✓)

 (ii) It is propan-1-ol because ethanoic acid would have a peak at around 1700¦cm−1 (✓)

 (b) (i) 3430¦cm−1 indicates O–H but because there is none at about 1700¦cm−1 it is not an acid (✓), so is an alcohol (✓)

 (ii) Amount of H = 0.167¦mol = 0.167¦g (✓)

 Amount of C = 0.0666¦mol = 12 × 0.0666 = 0.799¦g (✓)

 Mass of oxygen = 1.23 − 0.167 − 0.799 = 0.264¦g (✓)

 Amount of O  = 0.0165¦mol (✓)

 Ratio by moles of C¦:¦H¦:¦O = 0.0666¦:¦0.167¦:¦0.0165 = 4¦:¦10¦:¦1(✓)

 Empirical formula = C4H10O (✓) = molecular formula

 (iii) Because it has a straight carbon chain it is either CH3CH2CH2CH2OH (✓) or CH3CH2CH(OH)CH3 (✓)