2024 Higher Chemistry Paper 1 – Q10

Section: Nature’s Chemistry
Topic: Isoprene Units & Terpenes

Question summary (Q10):
Which structure has a correctly highlighted isoprene unit?

Worked Solution:
• An isoprene unit is a five-carbon block corresponding to 2-methylbuta-1,3-diene (C_5H_8).
• In terpenes, isoprene units are commonly identified in a head-to-tail arrangement: a four-carbon diene backbone with a methyl branch on C-2 relative to that backbone.
• The correct highlighting must therefore show a C_5 fragment with the diene pattern C=C–C=C and a side-chain methyl at the second carbon (the “isopropenyl” style methyl).
• Among the options, only Option A shows the C_5 segment marked so that the double-bond positions and the C-2 methyl branch match the isoprene pattern.

Final Answer: A — correctly highlighted isoprene unit

Revision Tips:
• Memorise: isoprene = 2-methylbuta-1,3-diene (C_5H_8).
• Look for a C_5 chunk with a methyl branch on the carbon next to one end of a 1,3-diene.
• In terpenes, count C_5 blocks to find mono- (C_{10}), sesqui- (C_{15}), di- (C_{20}) terpenes, etc.