

Question 35 (Answer: **A**)

- Addition polymerisation opens the $C=C$ of each monomer and joins the carbons into a chain.
- Propene is $CH_2=CHCH_3$, so the repeat unit is $-CH_2-CH(CH_3)-$.
- The n must appear on both sides, and no small molecule is lost.

Question 38 (Answer: **D**)

- Addition polymers can contain other atoms too – PVC has chlorine in every repeat unit.
- A polyester is made from a diol and a dicarboxylic acid; it is a *polyamide* that needs a diamine.
- The real distinction is that condensation polymerisation always loses a small molecule and addition never does.

Question 35 (Answer: **C**)

- To build a polymer with a dicarboxylic acid in a 1 : 1 ratio, each monomer needs *two* groups that react with $-COOH$.
- Both $-OH$ and $-NH_2$ react with $-COOH$, so a diamine, a diol and an amino-alcohol all work.
- The monomer that already carries a $-COOH$ has only one usable group left, so it cannot – three of the four qualify.

Question 37 (Answer: **B**)

- The two monomers are a diol and a dicarboxylic acid, so the polymer is a polyester.
- Each link forms by losing water between an $-OH$ and a $-COOH$ group.
- So the repeat unit shows the ester linkage $-COO-$ joining the two monomer residues.

Question 37 (Answer: **B**)

- Look at the linkage in the repeat unit: $-CO-NH-$ is an amide, so this is a polyamide like nylon.
- A polyamide is made from a diamine and a dicarboxylic acid.
- So pick the monomer pair with an $-NH_2$ at both ends of one and a $-COOH$ at both ends of the other.

Question 37 (Answer: **A**)

- Nylon is a polyamide, so its linkage is the amide $-CO-NH-$.
- A polyester is PET, whose linkage is $-COO-$ and contains no $C=C$.
- Propane has no double bond, so it cannot polymerise by addition – propene can.

Question 38 (Answer: **C**)

- Nylon is made from a diamine and a dicarboxylic acid, losing a small molecule at every link.
- That makes it condensation polymerisation, not addition.
- The small molecule lost is water.