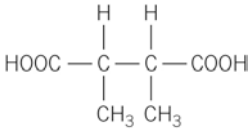
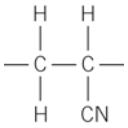
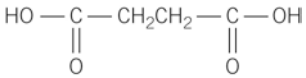
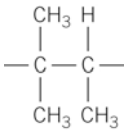
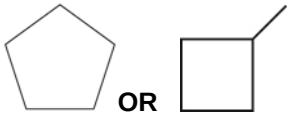
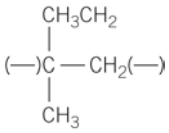
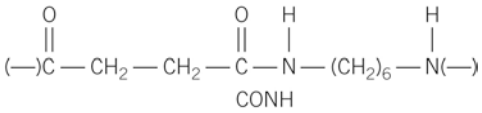
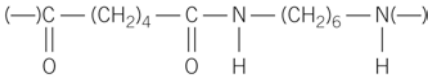
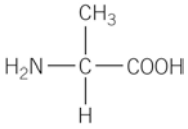
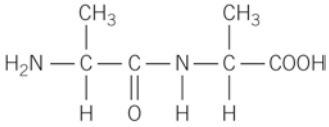
Question number	Answer	Marks	Guidance
1 (a)	$CH_3CH=CHCH_3$ addition polymerisation	2	If the monomer has a double C=C then it is addition polymerisation.
1 (b)	$CH_3CH(OH)CH(OH)CH_3$ or with no brackets butane–2,3–diol  2,3–dimethylbutanedioic acid condensation polymerisation	1 1 1 1 1	 numbers essential for marks Accept 2,3-dimethylbutanedioyl chloride. Remember if the 2 monomers are different and are both bifunctional then this will be condensation polymerisation.
1 (c)	NaOH or HCl or Na_2CO_3	1	Remember you cannot have water on its own.
2	polyamide or nylon (2,4) condensation	1 1	award the mark here for nylon with no numbers or an answer with correct numbers do not award the mark if the numbers are wrong
3 (a) (i)		1	trailing bonds at the ends are essential to show it continues to bond in a chain
3 (a) (ii)	Addition	1	
3 (b) (i)	$C_3H_4O_2$	1	the best way to figure this out is to count all the C, H, and O and then find the smallest ratio of them
3 (b) (ii)	 1,4-butanedioic acid	1 1	
3 (b) (iii)	Can be hydrolysed **OR** Can react with nucleophiles.	1	Either of these answers would be awarded the mark.
4 (a)	Additional 	1 1	You must show trailing ends on the repeating unit.
4 (b)	$CH_3CH=CHCH_2CH_3$	1	

4 (c)	 **OR**	1	
5 (a) (i)	2-methylbut-1-ene	1	
5 (a) (ii)	 addition	1 1	1 mark is given for the drawing of the correct repeating unit and 1 mark is given for naming the type of polymerisation.
5 (b)	 condensation (poly)peptide **OR** (poly)amide	2 2	Poly is not needed in the answer to gain the mark Make sure the amide is spelt correctly.
6 (a) (i)	hexane-1,6-diamine	1	
6 (a) (ii)		1	You could put CONH in this structure but it is better to show all the bonds.
6 (b) (i)		1	Remember to count the longest C chain even if it 'goes around corners' and put the NH_2 on it.
6 (b) (ii)		1	The peptide link is essential for the mark.
7 (a)	Polyalkenes are inert since they have a structure like a saturated alkane and are therefore difficult to react (unless there is UV light to break the bonds in the molecules)	2	These can have several sensible answers. You must think about the environmental aspects and 'How Science Works'.
7 (b)	Polyesters and polyamides can have the peptide link hydrolysed in acidic conditions or by enzyme action, etc.	2	
7 (c)	Not using up natural resources to make the raw materials and stops build-up of landfill sites with polymers in them.	2	