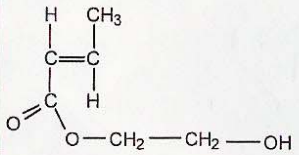
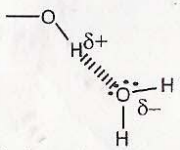
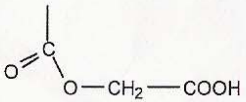
3 a	 double bond (1) completely correct (any chemically correct representation) (1)	2
3 b	covalent/hydrogen (bonds)	1
3 c	 hydrogen bond between H on one and O on other (1) *allow dotted line but not continuous line* at least one lone pair shown as starting point of bond (1) δ+/δ– shown correctly on O and H forming bond(1) (CON if OH^- shown, rather than –OH) straight line between two oxygens involved (1) (CON if OH_2 shown)	4
3 d	primary (1) attached to carbon which is attached to one carbon/attached to $-CH_2$ /end of chain(1) *depends on first mark*	2
3 e i	 –COOH correct (can be displayed) (1) rest of structure correct (i.e. no extra CH_2) (1) *OH on top bond scores (0)*	2
3 e ii	(potassium) dichromate (1); (sulphuric) acid (1); reflux/ heat (AW) *(if first mark scored)* (1)	3
3 f	they are less abrasive (AW) to the eye/ they allow gases to pass through/more flexible *allow more comfortable/can absorb tears/keep eyes moist/ last longer*	1

3 g i	*two from* C=C (1) lack of free rotation/planar/cannot twist (1) two different groups on each carbon atom (1) trans (1)	3
3 g ii	permanent (dipole) (–) permanent dipole (*NOT p.d.-p.d. or dipole-dipole*)	1
3 g iii	poly(ethene) more flexible because *chains* can slide over each other (1) more easily (1) *instantaneous (dipole)-induced dipole forces/Van der Waals forces* in poly(ethene) (1) *intermolecular forces* (however described) in polyethene weaker than those in PMMA (1) If imf in PMMA described, allow ecf from 3gii or variants eg "dipole-dipole" IGNORE references to side-chains, tangling etc QWC: At least two sentences, logical, two italicised terms used correctly.	4 1