| • Complete the following table. Make sure you complete the name of the starting material where indicated. |                         |  | Marks<br>1 |
|---|-------------------------|--|------------|
| STARTING MATERIAL   | REAGENTS/<br>CONDITIONS | CONSTITUTIONAL<br>FORMULA(S) OF MAJOR<br>ORGANIC PRODUCT(S)                      |            |
| Br—NH <sub>2</sub>  | 2 M HCl                 | $\operatorname{Br}$ $\operatorname{NH}_{3}^{\oplus} \operatorname{Cl}^{\ominus}$ |            |

Marks • Complete the following table. Make sure you complete the name of the starting 4 material or major product where indicated. CONSTITUTIONAL **REAGENTS**/ STARTING MATERIAL FORMULA(S) OF MAJOR CONDITIONS **ORGANIC PRODUCT(S)** HBr / CCl<sub>4</sub> (solvent) Br CH<sub>3</sub>CH<sub>2</sub>CHCH<sub>2</sub>CH<sub>3</sub>  $\begin{array}{c} CH_{3}CH_{2}CHCH_{2}CH_{3}\\ & \overset{\odot}{Br}^{\dagger}N(CH_{3})_{3} \end{array}$ Br (CH<sub>3</sub>)<sub>3</sub>N Name: 3-bromopentane Br hot conc. KOH in ethanol solvent

| • Complete the following table.                    |   |  |  |
|--|---|--|--|
| STARTING MATERIAL                                  | REAGENTS/<br>CONDITIONS   | CONSTITUTIONAL<br>FORMULA(S) OF<br>MAJOR ORGANIC<br>PRODUCT(S)                                 |  |
| CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> Br | N(CH <sub>3</sub> ) <sub>3</sub>  | $\begin{array}{c} CH_2CH_2CH_3\\ Br^{\ominus}  \overset{\oplus}{\to}  \\ N(CH_3)_3\end{array}$ |  |
| Br   | 1. Mg / dry ether<br>2. CO <sub>2</sub><br>3. H <sup>⊕</sup> / H <sub>2</sub> O | СООН   |  |
| S—s—   | $Zn / H^{\oplus}$   | 2 SH   |  |
|  | HBr / CCl <sub>4</sub> (solvent)  | (Markovnikov)  |  |

| • Complete the following table. |  |  |  |
|---------------------------------|--|--|--|
| STARTING MATERIAL               | REAGENTS/<br>CONDITIONS                      | CONSTITUTIONAL<br>FORMULA(S) OF MAJOR<br>ORGANIC PRODUCT(S)                    |  |
| H = O OH H H H H H OH           | CH <sub>3</sub> OH / H <sup>⊕</sup> catalyst | CH <sub>2</sub> OH<br>OH<br>OH<br>OH<br>OH<br>OH<br>OH<br>OH<br>OH<br>OH<br>OH |  |

Marks • Complete the following table. Make sure you give the name of the product or starting 4 material where requested. CONSTITUTIONAL STARTING **REAGENTS/CONDITIONS** FORMULA(S) OF MAJOR MATERIAL ORGANIC PRODUCT(S) CH<sub>2</sub>OH CH<sub>2</sub>Br PBr<sub>3</sub> (CH<sub>3</sub>CH<sub>2</sub>)<sub>3</sub>(CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>)N<sup>+</sup>  $CH_3CH_2CH_2Br$ (CH<sub>3</sub>CH<sub>2</sub>)<sub>3</sub>N Br<sup>-</sup> CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CHO 1. NaBH4 CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH 2.  $H^{\oplus}/H_2O$ Name: pentanal