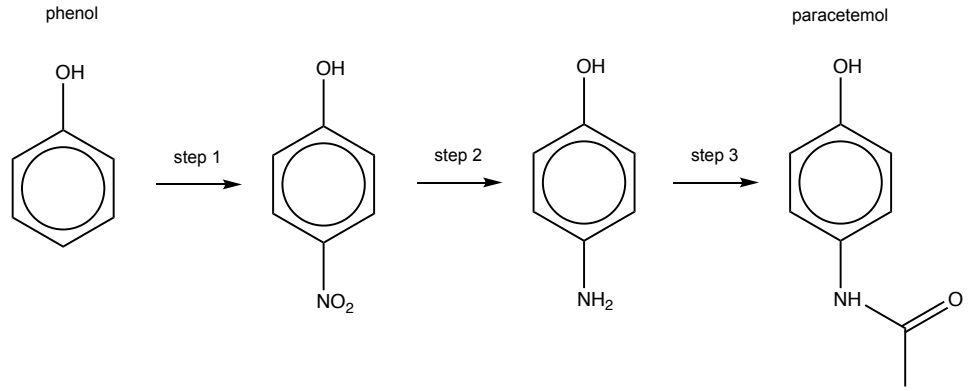
1) Paracetemol can be made in a 3-step synthesis from phenol.



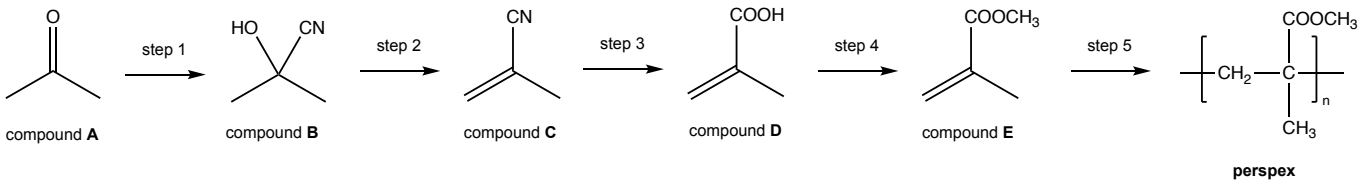
a) Complete the table about the steps shown.

Step	Reagents & conditions	Reaction type
1		
2		
3		

b) Name and outline the mechanism for step 1.

c) Name and outline the mechanism for step 3.

2) Perspex can be made by the following synthetic pathway.



compound **A** compound **B** compound **C** compound **D** compound **E** **perspex**

a) Give the IUPAC name of each compound.

Compound	IUPAC name
A	
B	
C	
D	
E	

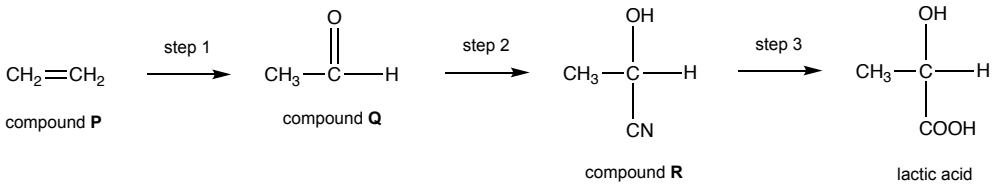
b) Complete the table about the steps shown.

Step	Reagents & conditions	Reaction type
1		
2		
4		

c) Name and outline the mechanism for step 1.

d) Name and outline the mechanism for step 2.

3) Lactic acid can be made by the following synthetic pathway.



compound **P** compound **Q** compound **R** lactic acid

a) Give the IUPAC name of each compound.

Compound	IUPAC name
P	
Q	
R	

b) Complete the table about step 2.

Step	Reagents & conditions	Reaction type
2		

c) Name and outline the mechanism for step 2.

d) Explain why the lactic acid is formed as a racemic mixture. .....

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4) The conversion of 1-bromo-2-methylpropane into 2-bromo-2-methylpropane via compound **X** can be achieved as shown.

The infrared spectrum of compound **X** has a signal at 1650 cm^{-1}

a) Give the structure of compound **X**.

b) Complete the table about the synthesis.

Step	Reagents & conditions	Reaction type
1		
2		

c) Name and outline the mechanism for step 1.

d) Name and outline the mechanism for step 2.

e) Explain why 2-bromo-2-methylpropane is formed predominantly rather than 1-bromo-2-methylpropane in step 2.

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