# Paper 1

**Questions are applicable for both core and extended candidates**

**1** Which row explains why plastics such as poly(ethene) cause pollution?

| | produce toxic gases when burned | accumulate in the oceans |
|---|---|---|
| **A** | no | no |
| **B** | no | yes |
| **C** | yes | no |
| **D** | yes | yes |

**2** Which row describes the relative sizes of monomer and polymer molecules?

| | monomer | polymer |
|---|---|---|
| **A** | large | large |
| **B** | large | small |
| **C** | small | large |
| **D** | small | small |

**3** In reaction R, 2000 molecules of $CH_2=CH_2$ react to form a single molecule X only.

$$2000\ CH_2=CH_2 \rightarrow X$$

Which terms describe reaction R, $CH_2=CH_2$ and X?

| | reaction R | $CH_2=CH_2$ | X |
|---|---|---|---|
| **A** | addition | monomer | polymer |
| **B** | addition | polymer | monomer |
| **C** | substitution | monomer | polymer |
| **D** | substitution | polymer | monomer |

**4** Polymers are long-chain molecules made from small molecules linked together.

Four polymers or types of polymer are listed.

1 carbohydrates

2 nylon

3 proteins

4 *Terylene*

Which polymers or types of polymer are synthetic?

**A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

**5** Many molecules of J join together in reaction R to form a long chain molecule K.

K is the only product.

Which row describes molecule J, reaction R and molecule K?

| | molecule J | reaction R | molecule K |
|---|---|---|---|
| **A** | polymer | addition | monomer |
| **B** | monomer | addition | polymer |
| **C** | polymer | cracking | monomer |
| **D** | monomer | cracking | polymer |

**6** Some information about four substances, P, Q, R and S, is listed.

P is made by combining many small molecules together.

Molecules of Q are the largest molecules found in petroleum.

R is produced by cracking alkanes.

S is nylon.

Which substances are synthetic polymers?

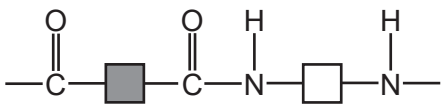
**A** P and Q **B** P and S **C** Q and R **D** R and S

# Paper 2

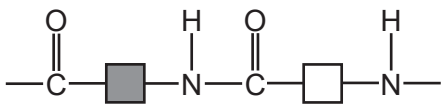
**Questions are applicable for both core and extended candidates unless indicated in the question**

**7** Parts of the structure of two different polymers, X and Y, are shown.

X



Y



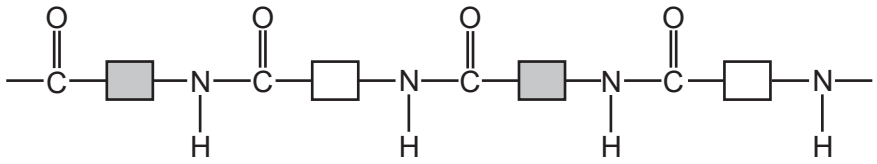
Which row about the monomers and the linkages between the monomers in polymers X and Y is correct? **(extended only)**

| | monomers in X and Y | linkages |
|---|---|---|
| **A** | different | the linkages in X are different from the linkages in Y |
| **B** | different | the linkages in X are the same as the linkages in Y |
| **C** | same | the linkages in X are different from the linkages in Y |
| **D** | same | the linkages in X are the same as the linkages in Y |

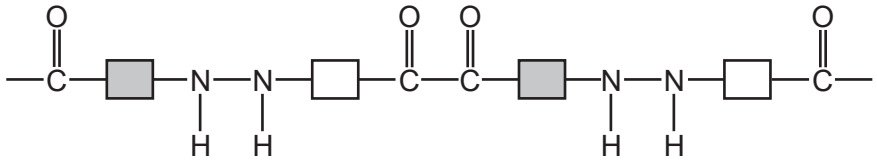
**8** Nylon is formed by condensation polymerisation.

Which structure represents nylon? **(extended only)**

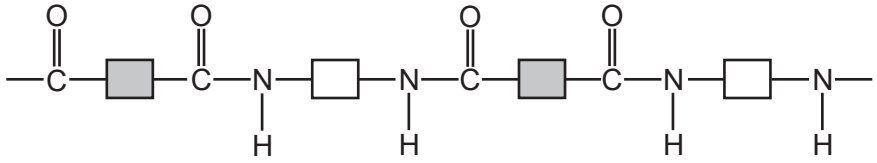
**A**



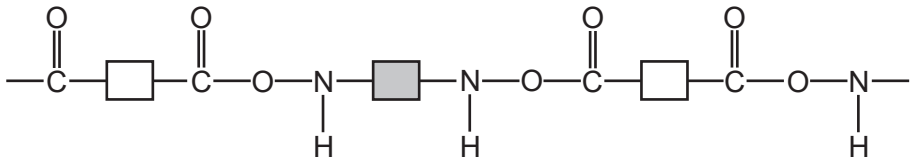
**B**



**C**



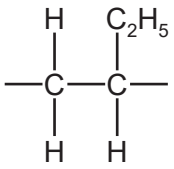
**D**



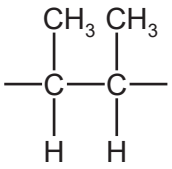
**9** Which structure represents the repeat unit of the addition polymer formed from but-1-ene?

**(extended only)**

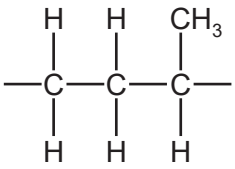
**A**



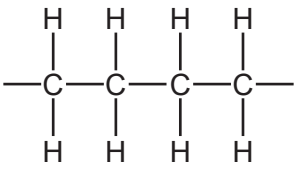
**B**



**C**



**D**



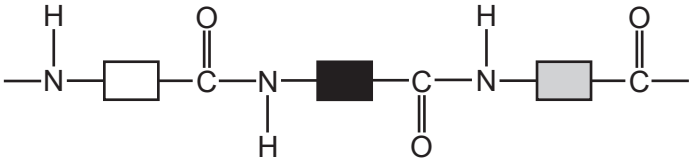
**10** In reaction R, 2000 molecules of $CH_2=CH_2$ react to form a single molecule X only.

$$2000\ CH_2=CH_2 \rightarrow X$$

Which terms describe reaction R, $CH_2=CH_2$ and X?

| | reaction R | $CH_2=CH_2$ | X |
|---|---|---|---|
| **A** | addition | monomer | polymer |
| **B** | addition | polymer | monomer |
| **C** | substitution | monomer | polymer |
| **D** | substitution | polymer | monomer |

**11** Part of the structure of a polymer is shown.



Which statements about the polymer are correct? **(extended only)**

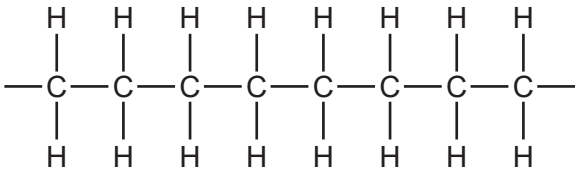
1 The polymer is nylon.

2 The polymer is formed by condensation polymerisation.

3 There are ester linkages between the monomers.

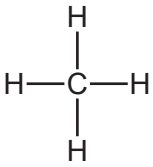
**A** 1 and 2 **B** 2 and 3 **C** 2 only **D** 3 only

**12** The diagram shows part of a polymer.

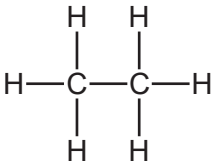


Which diagram shows the monomer from which this polymer is made? **(extended only)**

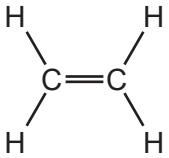
**A**

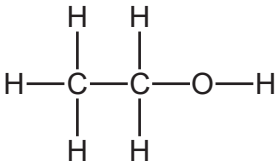


**B**



**C**





**13** Nylon and PET are polymers.

Which statements about these polymers are correct? **(extended only)**

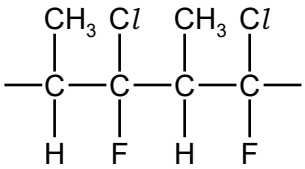
1 They are both condensation polymers.

2 $HOCH_2CH_2CH_2OH$ could be a monomer for both polymers.

3 The complete combustion of both polymers gives two products only.

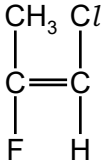
**A** 1 and 2 **B** 1 and 3 **C** 1 only **D** 2 and 3

**14** Part of the structure of a polymer is shown.

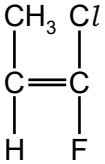


Which monomer is used to make this polymer? **(extended only)**

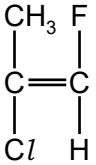
**A**



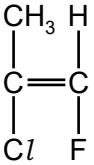
**B**



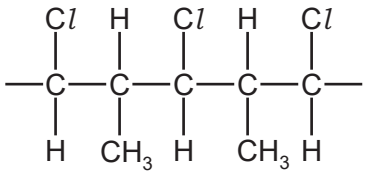
**C**



**D**

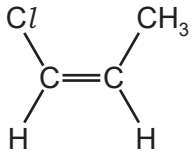


**15** The structure of part of a polymer is shown.

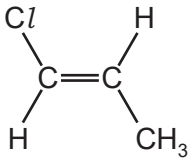


Which monomers can be used to make this polymer? **(extended only)**

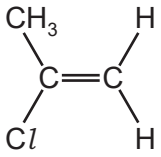
1



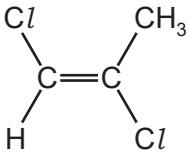
2



3



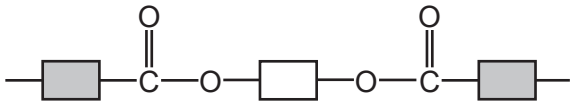
4



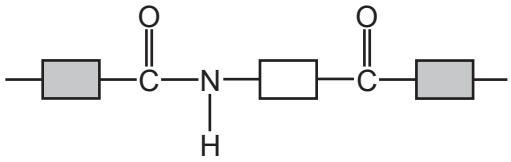
**A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

**16** Which diagram represents the structure of nylon? **(extended only)**

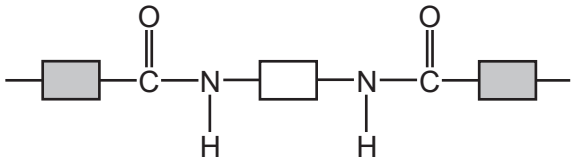
**A**



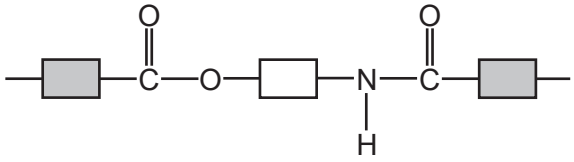
**B**



**C**



**D**



**17** Which polymer is a synthetic polyamide? **(extended only)**

**A** nylon

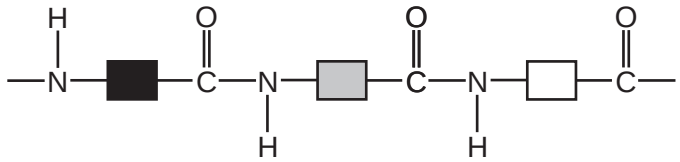
**B** poly(ethene)

**C** protein

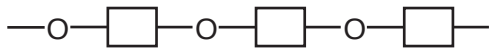
**D** *Terylene*

**18** Which structure represents *Terylene*? **(extended only)**

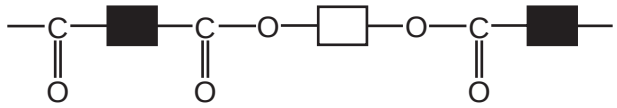
**A**



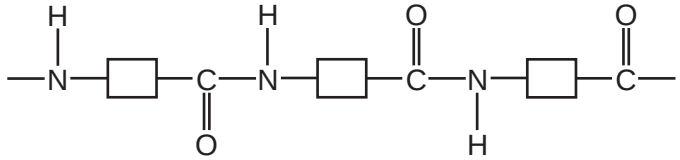
**B**



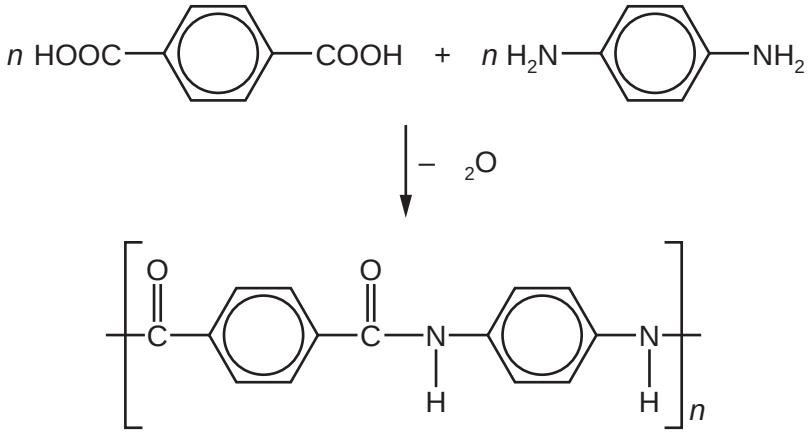
**C**



**D**



**19** The equation shows the formation of a polymer called *Kevlar*.




Which row describes *Kevlar*? **(extended only)**

| | how the polymer is formed | type of polymer |
|---|---|---|
| **A** | addition polymerisation | polyamide |
| **B** | addition polymerisation | polyester |
| **C** | condensation polymerisation | polyamide |
| **D** | condensation polymerisation | polyester |