



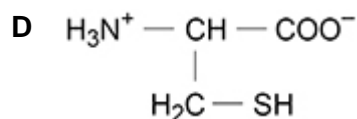
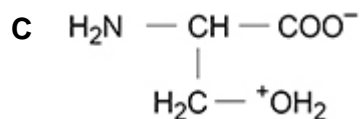
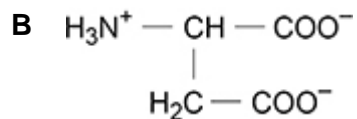
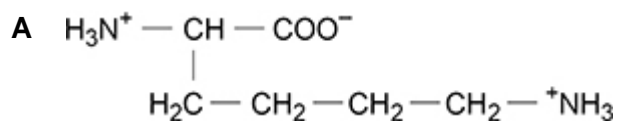
A-Level Chemistry
Amino Acids and Proteins
(Multiple Choice)
Question Paper

Time available: 13 minutes
Marks available: 12 marks

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1.

Which is the structure of a zwitterion of an amino acid?

**(Total 1 mark)****2.**

Which row shows a pair of bases that can link two strands of DNA with three hydrogen bonds?

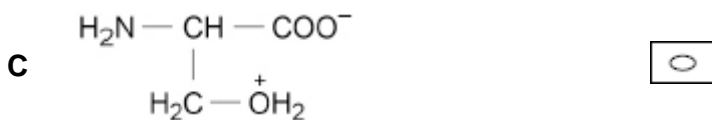
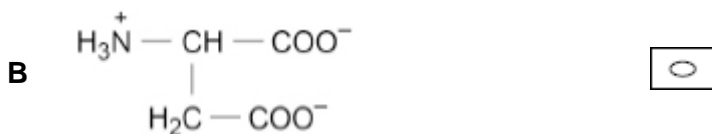
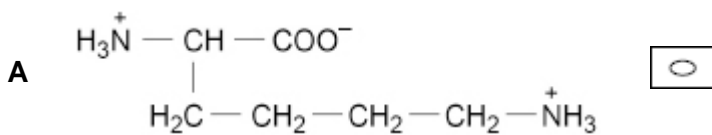
Use the Data Booklet to help you answer this question.

	Base 1	Base 2	
A	adenine	guanine	<input type="radio"/>
B	cytosine	thymine	<input type="radio"/>
C	cytosine	guanine	<input type="radio"/>
D	adenine	thymine	<input type="radio"/>

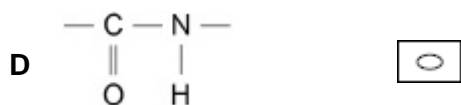
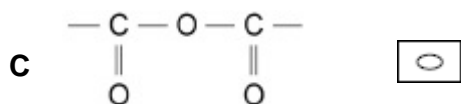
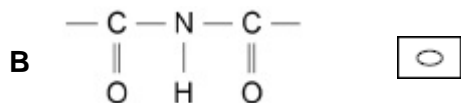
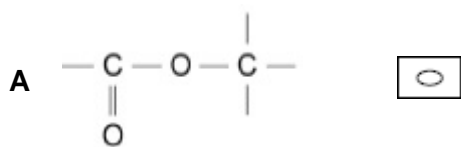
(Total 1 mark)

3.

Which structure shows the zwitterion of an amino acid?

**(Total 1 mark)****4.**

Which structure shows part of a peptide link in a protein?

**(Total 1 mark)**

5. Which type of interaction between polypeptide chains is mainly responsible for maintaining the secondary structure of a protein in the form of an alpha helix?

A covalent bonds

B hydrogen bonds

C ionic interactions

D van der Waals forces

(Total 1 mark)

6. Which compound is **not** a 2-aminocarboxylic acid?

A $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$

B $\text{CH}_3\text{CH}(\text{NH}_2)\text{CH}_2\text{COOH}$

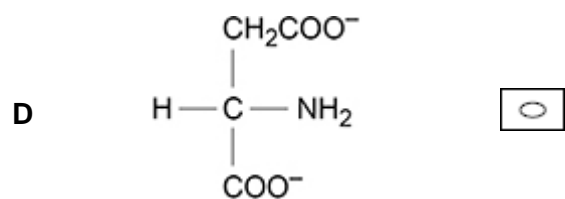
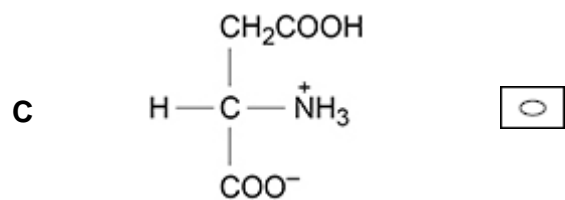
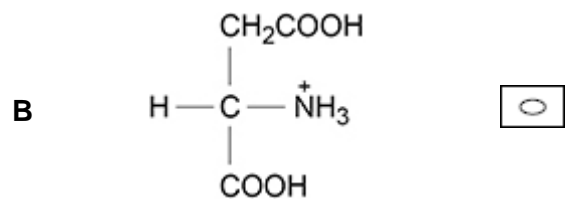
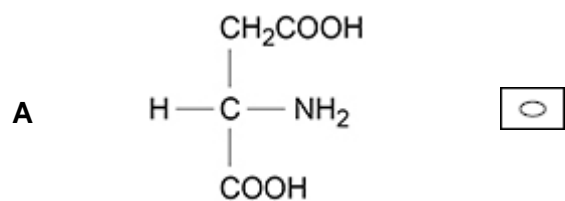
C $\text{CH}_3\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$

D $(\text{CH}_3)_2\text{CHCH}(\text{NH}_2)\text{COOH}$

(Total 1 mark)

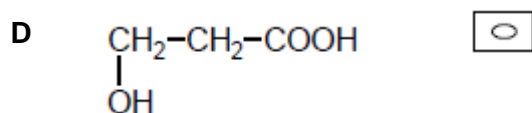
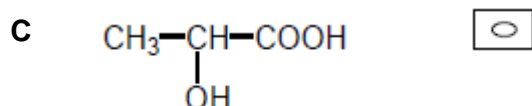
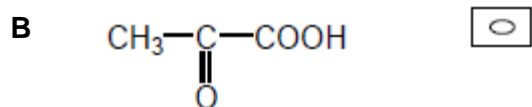
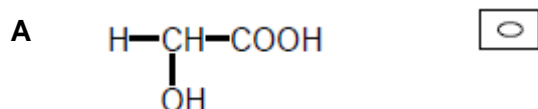
7.

Which is the main species present in an aqueous solution of aspartic acid at pH = 14?

**(Total 1 mark)**

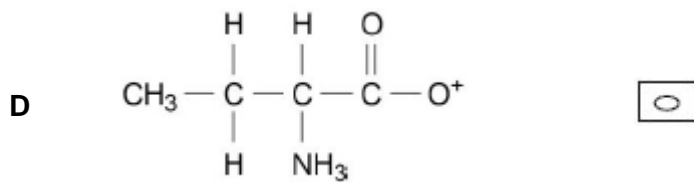
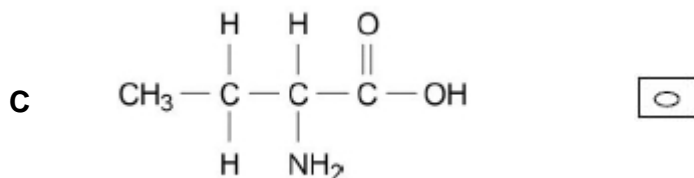
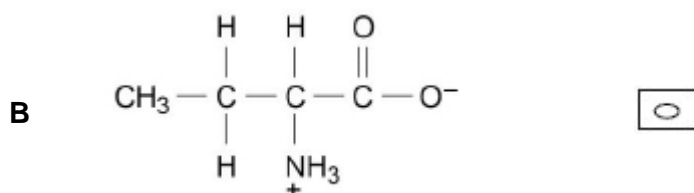
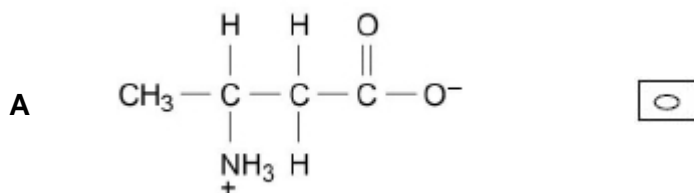
8. A drug is designed to simulate one of the following molecules that adsorbs onto the active site of an enzyme.

Which molecule requires the design of an optically active drug?



(Total 1 mark)

9. Which structure shows 2-aminobutanoic acid as a zwitterion?

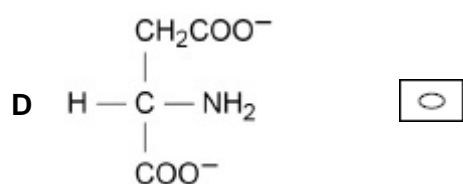
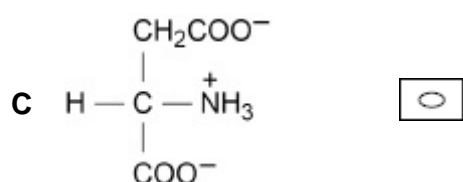
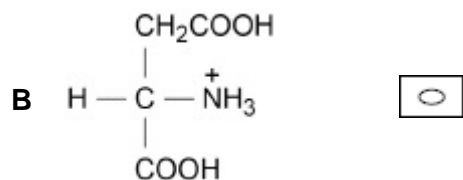
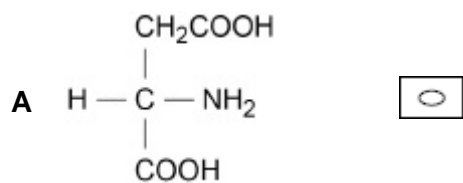


(Total 1 mark)

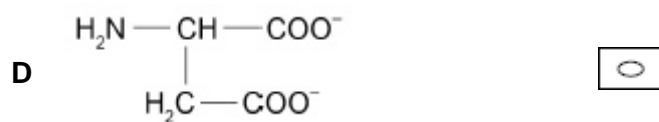
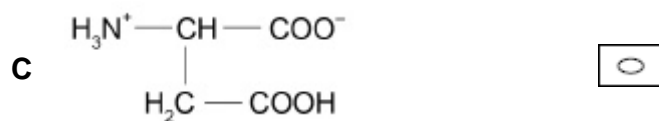
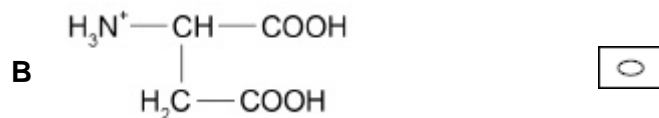
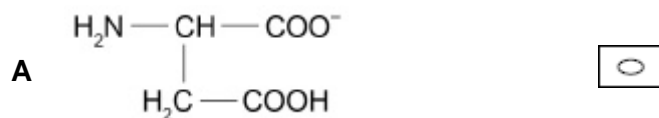
10.

Use the Data Booklet to help you answer this question

Which is the main aspartic acid species present in an aqueous solution at pH = 14?

**(Total 1 mark)****11.**

Which structure is formed by aspartic acid in solution at pH 12?

**(Total 1 mark)**

12.

Two strands of DNA are linked together by hydrogen bonding between bases on each strand. Which row shows the number of hydrogen bonds between the pair of bases? Use the Data Booklet to help you answer this question.

	Base 1	Base 2	Number of hydrogen bonds	
A	adenine	guanine	2	<input type="checkbox"/>
B	cytosine	thymine	2	<input type="checkbox"/>
C	guanine	cytosine	3	<input type="checkbox"/>
D	adenine	thymine	3	<input type="checkbox"/>

(Total 1 mark)