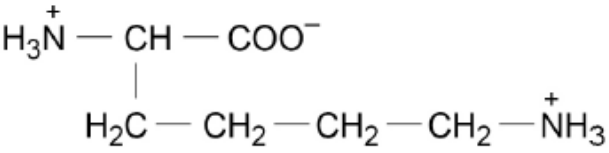
AQA – Amino acids, Proteins and DNA – A2 Chemistry P3

1. June/ 2020/Paper_3/No.30

Which structure shows the zwitterion of an amino acid?

[1 mark]

A



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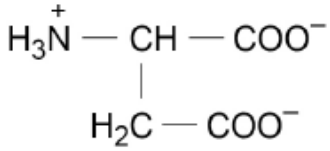

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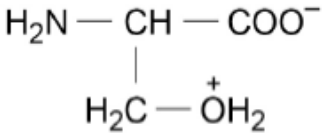

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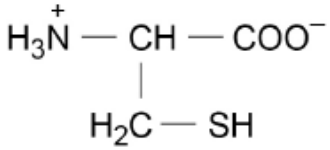
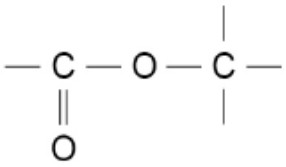


2. June/ 2019/Paper_3/No.29

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

[1 mark]

A



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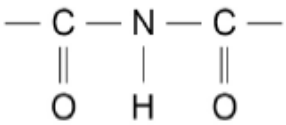

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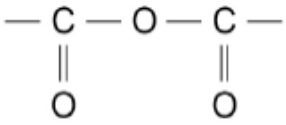

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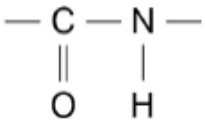


3. June/ 2019/Paper_3/No.30

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.

[1 mark]

	Base 1	Base 2	Number of hydrogen bonds
A	adenine	guanine	2
B	cytosine	thymine	2
C	guanine	cytosine	3
D	adenine	thymine	3

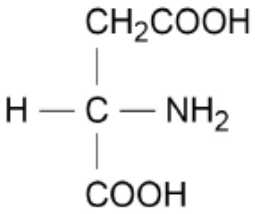
4. June/ 2019/Paper_3/No.35

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?

[1 mark]

A



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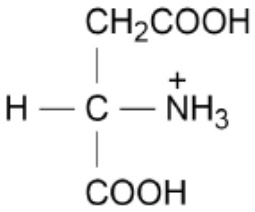

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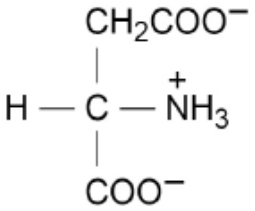

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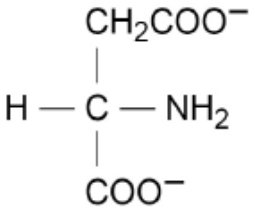


5. June/2021/Paper_3/No.2

0 2 The protein fibroin can be broken down into amino acids using an enzyme.

0 2 . 1 A student uses thin-layer chromatography (TLC) to identify these amino acids.

The student identifies two of the amino acids as alanine and serine.

Use **Figure 3** to calculate the R_f value of the unknown amino acid.
Show your working.

Use your R_f value and **Table 1** to identify the unknown amino acid.

[2 marks]

Figure 3

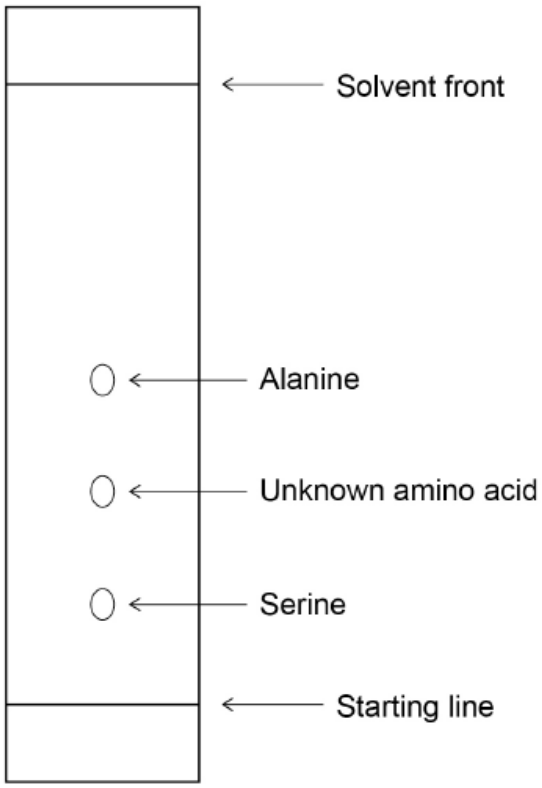


Table 1

Amino acid	**R_f value**
tyrosine	0.25
glycine	0.34
valine	0.64
leucine	0.73

R_f value _____

Identity _____

0 2 . 2 The amino acids cannot be seen as they move during the experiment.

State how the amino acids can be made visible at the end of the experiment.

[1 mark]

0 2 . 3 State why each amino acid has a different R_f value.

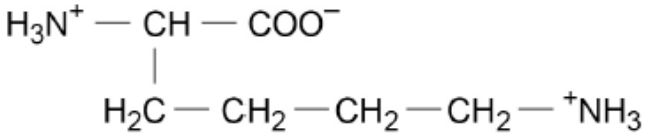
[1 mark]

6. June/2021/Paper_3/No.35

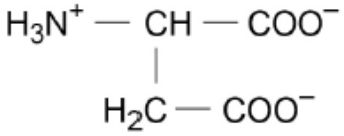
Which is the structure of a zwitterion of an amino acid?

[1 mark]

A



B



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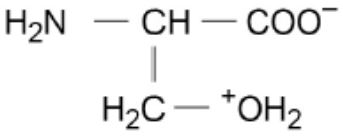
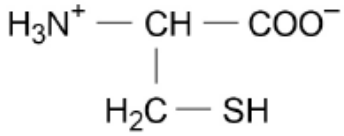


D



7. June/2021/Paper_3/No.36

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.

[1 mark]

	Base 1	Base 2
A	adenine	guanine
B	cytosine	thymine
C	cytosine	guanine
D	adenine	thymine