Exam Papers Practice

2.3 Proteins

Question Paper

Course	DP IB Biology
Section	2. Molecular Biology
Topic	2.3 Proteins
Difficulty	Medium

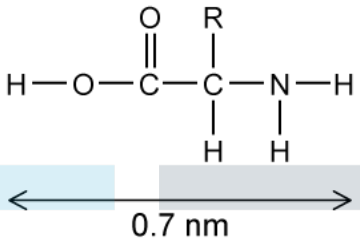
To be used by all students preparing for DP IB Biology SL
Students of other boards may also find this useful

Question 1

Amino acids consist of oxygen, hydrogen, carbon and nitrogen atoms. The diameter of each atom when bonded to another atom is shown in the table below.

atom	single bond / nm	double bond / nm
O	0.13	-
H	0.06	0.110
C	0.154	0.120
N	0.14	0.134

Using the figures in the table, the approximate length of one amino acid is 0.7 nm, as shown below.



What would be the approximate length of a dipeptide of this amino acid after a condensation reaction has occurred?

A. 1.0 nm

B. 1.2 nm

C. 1.4 nm

D. 1.6 nm

[1 mark]

Question 2

Which of the following chemical groups does **not** bond directly with the central carbon of an amino acid?

A. –OH

B. $-NH_2$

C. –COOH

D. –H

[1 mark]

Question 3

All life (except for a few primitive, prokaryotic species) use the same 20 amino acids joined into polypeptides.

Which of the four statements above is **not** a possible hypothesis for why all life uses the same 20 amino acids?

A. Only the 20 amino acids existed when life began, so all life now uses them.

B. All organisms share a common ancestor, so the link between the genetic code and amino acids sequences is already fixed.

C. Polypeptide chains join together to increase the range of possible functions that they can carry out

D. 20 amino acids is more than enough to give a huge, almost infinite range of characteristics for all life.

[1 mark]

Question 4

Which of the following causes fibrous polypeptides to be insoluble?

A. They are very long.

B. Their surface has nonpolar amino acids.

C. They are usually structural.

D. They have more than one polypeptide chain.

[1 mark]

Question 5

Which row of the table best classifies common proteins with differing numbers of polypeptide chains?

	One polypeptide chain	Two polypeptide chains	Three polypeptide chains
A	Collagen	Insulin	Haemoglobin
B	Lysozyme	Insulin	Collagen
C	Lysozyme	Haemoglobin	Insulin
D	Haemoglobin	Lysozyme	Collagen

[1 mark]

Question 6

Which of the following words best describes the structure of a large macromolecule (such as a protein) and its final 3–D shape?

A. Presentation

B. Structure

C. Confirmation

D. Conformation

[1 mark]

Question 7

Which of the following statements about the proteome is correct?

A. The proteome is the full range of proteins that an organism could produce from its genome.

B. The proteomes of closely related people are identical.

C. The proteome is usually smaller than the genome of an organism.

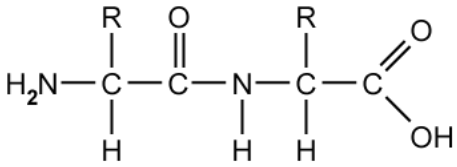
D. The proteome varies during an organism's lifetime.

[1 mark]

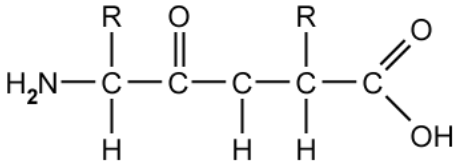
Question 8

Which of the following diagrams correctly shows the structure of a dipeptide?

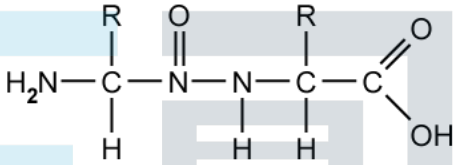
A



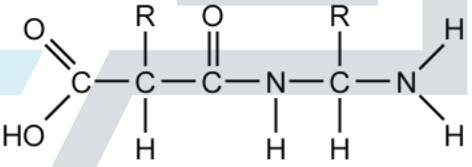
B



C



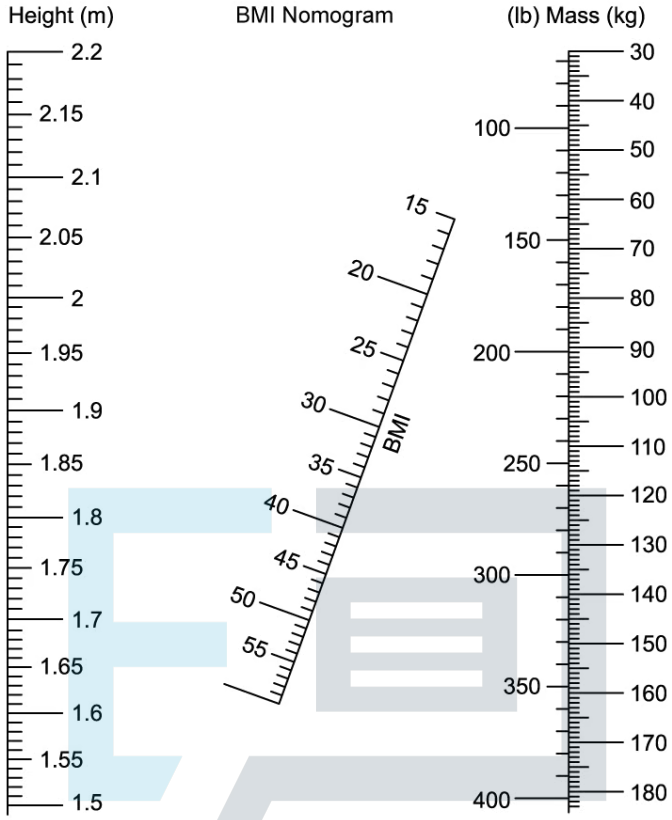
D



[1 mark]

Question 9

Using the nomogram below, what is the Body Mass Index of a person of height 1.65 m and mass 130 lbs?



A. 24

B. 22

C. 20

D. 25

[1 mark]

Question 10

When using molecular visualisation software to represent large biological molecules, which aspect of a macromolecule would not necessarily be distinguishable?

A. The surface topography (eg. of a cell-surface receptor).

B. The location of the active site of an enzyme.

C. The flexing of a molecule when in aqueous solution.

D. The presence of a cavity to show an ion channel through a membrane protein.

[1 mark]