



Health and Environment

Below are examples of questions used for a previous Health and Environment test, so please disregard any references to a lecture.

In the new test, you must answer either the compulsory Biology question or the compulsory Chemistry question plus one of the other three questions available. Do NOT answer both the Biology and Chemistry question.

Please note, the questions below are for demonstration purposes only and the questions in the final test may take a different format.

EXAMPLE COMPULSORY BIOLOGY QUESTION

Each question carries 20 marks

Either

(a) Thinking of the principles of transport across cell membranes, what limits the size of cells?

Or

(b) Write answers for **five** of the following (4 marks each):

- (i) What are the different types of muscle in the human body?
- (ii) What would you have to do to a fly's body to scale it to the size of an elephant?
- (iii) Give an example of a GM material and how it is an improvement on the wild version?
- (iv) Surfaces can be perceived as coloured. What does this mean?
- (v) What links reptilian scales and birds' wings?
- (vi) What causes biological structures to lose elasticity?
- (vii) After death of a person, cells die at varying rates. How might this be useful?

EXAMPLE COMPULSORY CHEMISTRY QUESTION

The expression of biological materials requires protein to be manufactured through machinery that proceeds from DNA instructions via an RNA intermediate.

- a) What are the potential issues with self-replicating molecules such as DNA and RNA and how might this contribute to evolution of novel materials? (5 marks)
- b) Before enzymes evolved, it is thought that RNA catalysts called ribozymes performed the task of accelerating chemical reactions. Since RNA molecules have fewer groups available for acid/base and electrostatic catalysis (compared to protein enzymes) they may make more use of transition state binding as their predominant mode of catalytic activity.
- Can you give an example of an S_N2 reaction?
 - Why might S_N2 reactions have been very important in the evolution of novel materials? (10 marks)
- c) Proteins are formed via condensation reactions between amino acid building blocks. Individual amino acids are denoted by a one letter code.
- If CARL GOMBRICH was a peptide, can you draw what he would look like using the table below?
 - What are the reaction products? (5 marks)

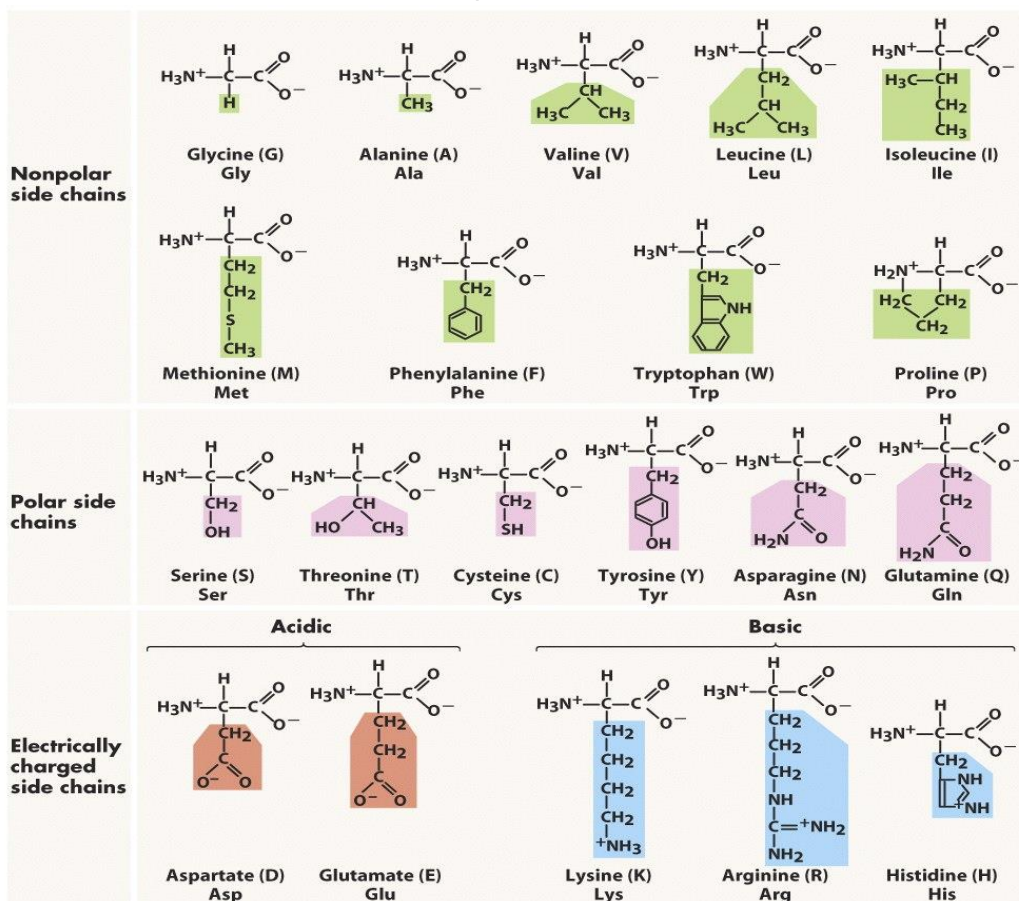


Figure 3-5 Biological Science, 2/e

EXAMPLE OPTIONAL QUESTIONS – you will answer one of these in the final test.

3. How accurately do we perceive the material world?
4. What can evolution tell us about biological structures?
5. How does the brain represent the material world?