



Biology Leaving Certificate Higher Level

Past Exam Questions on:

DNA & RNA

Q6 2013

6. (a) (i) In DNA, nitrogenous bases occur in complementary pairs. Explain the term *complementary* as used here.
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- (ii) In each case, name the complementary base in RNA for:
1. Adenine _____
 2. Cytosine _____
- (iii) Name a carbohydrate that is a component of nucleotides.
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- (iv) Name a component of a nucleotide that is neither a carbohydrate nor a nitrogenous base.
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- (b) (i) What does the 'm' stand for in mRNA? _____
- (ii) Give **one** difference between RNA and DNA, other than the nitrogenous bases.
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- (iii) Give the role of the enzyme RNA polymerase.
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Q10 2012

10. (a) (i) Nucleic acids are composed of subunits called nucleotides. Each nucleotide is formed from a sugar, a phosphate group and a nitrogenous base.
Name the two **types** of nitrogenous base found in DNA.
- (ii) Give **both** of the specific base pairs in DNA structure. (9)

Q9 2011

9. (a) (i) How are the two strands of a DNA molecule joined together? _____
- (ii) What is 'junk' DNA? _____
- (b) Answer the following questions by referring to the procedures that you used to isolate DNA from a plant tissue.
- (i) Having obtained a plant tissue e.g. onion,
1. What was the first procedure that you followed?

 2. What was the reason for that procedure?

- (ii) Washing-up liquid is then used in the isolation. Give a reason for its use.

- (iii) Salt (sodium chloride) is also used in the isolation. Give a reason for its use.

- (iv) 1. What is a protease?

2. Why is a protease necessary when isolating DNA?

- (v) The final stage of the isolation involves the use of freezer-cold ethanol.
1. Describe how it is used. _____
 2. For what purpose is it used? _____

Q 10 2010

10. Part (a) deals with DNA structure and replication.

- (a) (i) Name the base in DNA that pairs with cytosine.
- (ii) What are the two main events in the replication of DNA? (9)

Part (b) deals with protein synthesis.

- (b) (i) Explain the terms *transcription* and *translation*.
- (ii) In which structures in the cell does translation occur?
- (iii) How many bases in sequence make up a codon in mRNA?
- (iv) Each mRNA codon specifies one of three possible outcomes during protein synthesis. Name these **three** possible outcomes.
- (v) What does the letter 't' stand for in tRNA?
- (vi) During translation one end of a tRNA molecule attaches to an mRNA codon. What is usually attached to the other end of the tRNA molecule? (27)

Q 10 2009

- 10. (a) (i) State Mendel's Law of Segregation.
- (ii) Name two cell organelles, other than the nucleus, that contain DNA. (9)

Q14(b) 2008

- (b) (i) DNA is made of units called nucleotides. Draw a labelled diagram of a nucleotide to show its three constituent parts.
- (ii) Which of the labelled parts in your diagram in (i) may vary from nucleotide to nucleotide?
- (iii) The genetic code is contained within the DNA of chromosomes. Briefly describe the nature of this code.
- (iv) What is meant by non-coding DNA?
- (v) Give **one** structural difference between DNA and RNA.
- (vi) Name a cell organelle, apart from the nucleus, in which DNA is found.

Q10 2007

- 10.(a) (i) The DNA molecule is composed of two strands held together by paired bases.
1. Which base can link only to thymine?
2. Which base can link only to cytosine?
(ii) Name the type of bonding which occurs between members of a base pair. (9)
- (b) (i) Explain what is meant by the term DNA profiling.
(ii) Give a brief account of the stages involved in DNA profiling.
(iii) Give **two** applications of DNA profiling.
(iv) What is genetic screening? (27)
- (c) “The same amount of DNA is present in nuclei of cells taken from the liver, heart, pancreas and muscle of a rat.”
(i) Use your knowledge of DNA and mitosis to explain this statement.
(ii) Name a cell produced by the rat which will contain a different amount of DNA in its nucleus to those mentioned above.
(iii) Briefly outline how you isolated DNA from a plant tissue. (24)

Q7 2006

7. (a) State a use of each of the following in the biology laboratory.
- (i) Biuret test (copper sulphate and sodium hydroxide solutions)
- (ii) Benedict’s (or Fehling’s) test
- (b) In the case of each of the following state:
- An investigation in which you used it,
 - The precise purpose for its use in the investigation that you have indicated.
- (i) IAA
- 1
- 2
- (ii) Starch or skimmed milk agar plates.
- 1
- 2
- (iii) Cold alcohol (ethanol)
- 1
- 2

(iv) Alkaline pyrogallol or anaerobic jar

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2

Q8 2005

8. (a) Explain each of the following terms in relation to DNA.
- (i) R e p l i c a t i o n
 - (ii) T r a n s c r i p t i o n
- (b) As part of your practical activities you extracted DNA from a plant tissue. Answer the following questions in relation to this experiment.
- (i) What plant did you use?
 - (ii) It is usual to chop the tissue and place it in a blender. Suggest a reason for this.

 - (iii) For how long should the blender be allowed to run?
 - (iv) Washing-up liquid is normally used in this experiment. What is its function?

 - (v) Sodium chloride (salt) is also used. Explain why.

 - (vi) What is a protease enzyme?
 - (vii) Why is a protease enzyme used in this experiment?

 - (viii) The final separation of the DNA involves the use of alcohol (ethanol). Under what condition is the alcohol used?

