

Cells Homework 3

1. The genetic code determines the order of

- A bases in a protein
- B amino acids in a protein
- C amino acids in mRNA strand
- D sugars in a DNA strand

2. Which row in the table identifies the correct order of genetic engineering.

Stage in Genetic Engineering				
	1st	2nd	3rd	4th
A	Required gene identified	Gene and plasmid extracted	Gene inserted into plasmid	Modified cells grown
B	Required gene identified	Gene inserted into plasmid	Gene and plasmid extracted	Modified cells grown
C	Gene inserted into plasmid	Required gene identified	Modified cells grown	Gene and plasmid extracted
D	Gene inserted into plasmid	Modified cells grown	Gene and plasmid extracted	Required gene identified

3. Which of the following is NOT found in a bacterial cell.

- A cytoplasm
- B membrane
- C ribosomes
- D mitochondria

4. The DNA present in a chromosome carries information that determines the structure and therefore the function of

- A lipids
- B bases
- C carbohydrates
- D protein

Using the following information to answer Q5 & 6.

DDT can be sprayed onto crops to kill insects. It can be washed off the crops by rainwater and flow into rivers where it accumulates in food chains.

Food chain: algae → stickleback → trout → osprey
DDT concentration: 0.001 2.0 5.0 20.0

A typical freshwater food chain and the concentration of DDT in each organism is shown below.

5. The **percentage increase** in DDT concentration between the trout and osprey is

- A 15
- B 100
- C 300
- D 400.

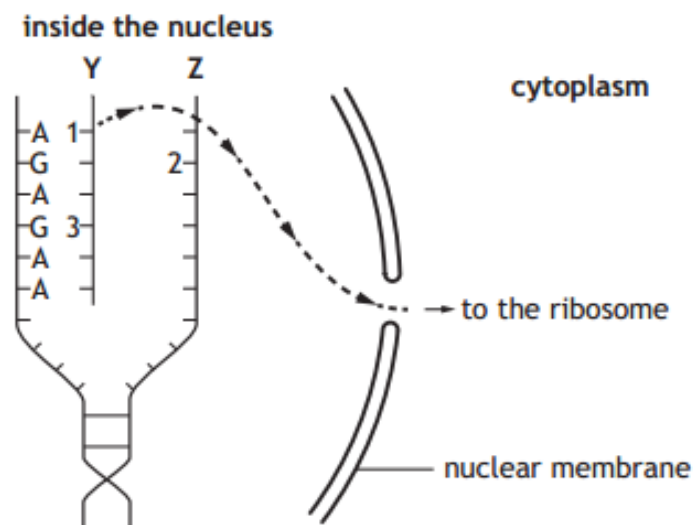
6. The **simplest whole number ratio** of algae to trout is:

- A 1: 500
- B 500: 1
- C 1: 5000
- D 5000: 1

7. Proteins have different functions. Which of the following statements identifies a protein and its function?

- A Hormones carry oxygen around the body.
- B Enzymes are on cell membranes of target tissues and combine with specific hormones
- C Antibodies defend the body against disease.
- D Receptors are chemical messengers that travel around the body.

1. The diagram below shows how genetic information in the nucleus is used in the first stage of making a protein.



- (a) (i) Name molecule Y.

1

- (ii) Underline one option in each bracket to make the following sentences correct.

2

1. The molecules represented by the letter A are

bases

genes

proteins
2. The complementary strand Z would have the letter

A

C

G

T

 at position 2 in the diagram.

- (b) Name the basic units which are joined together to make a protein at the ribosome.

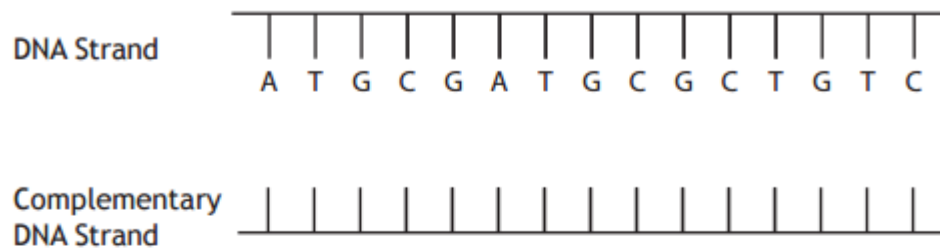
1

- (c) The diagram above shows a section of the code to make a protein such as amylase. Describe how the code to make the protein insulin would differ from this.

1

2

- (a) DNA is a double stranded molecule. The following diagram shows part of one strand. Complete the diagram to show the complementary strand.



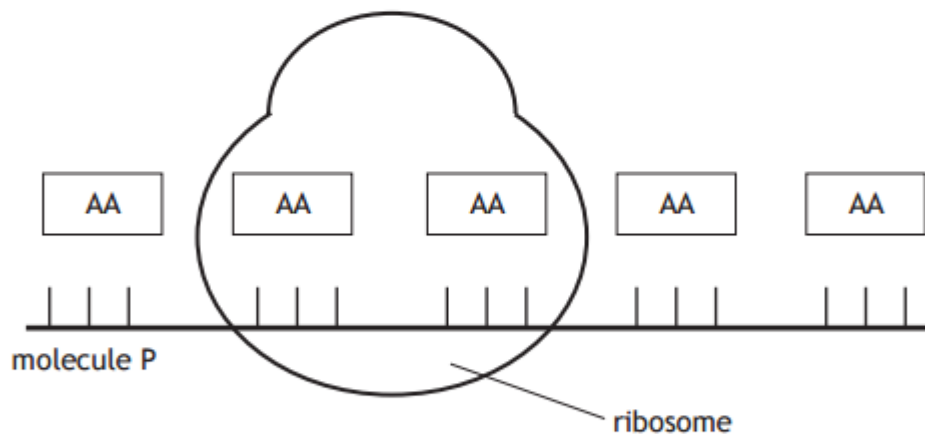
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- (b) (i) DNA contains genetic material which controls the synthesis of chemicals made from amino acids.

Name the type of chemicals synthesised.

1

- (ii) The diagram below shows an example of one of these chemicals being synthesised.



Name molecule P and describe how it determines the sequence of amino acids, represented by AA, as shown in the diagram.

2

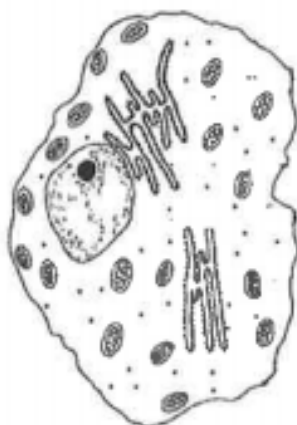
Molecule P _____

Description _____

- (iii) Name the part of the cell where molecule P was made.

1

- 3 The diagram below shows features of the ultrastructure of an animal cell.



- (a) Name the structure, shown in the diagram, which contains the cell's genetic information.

1

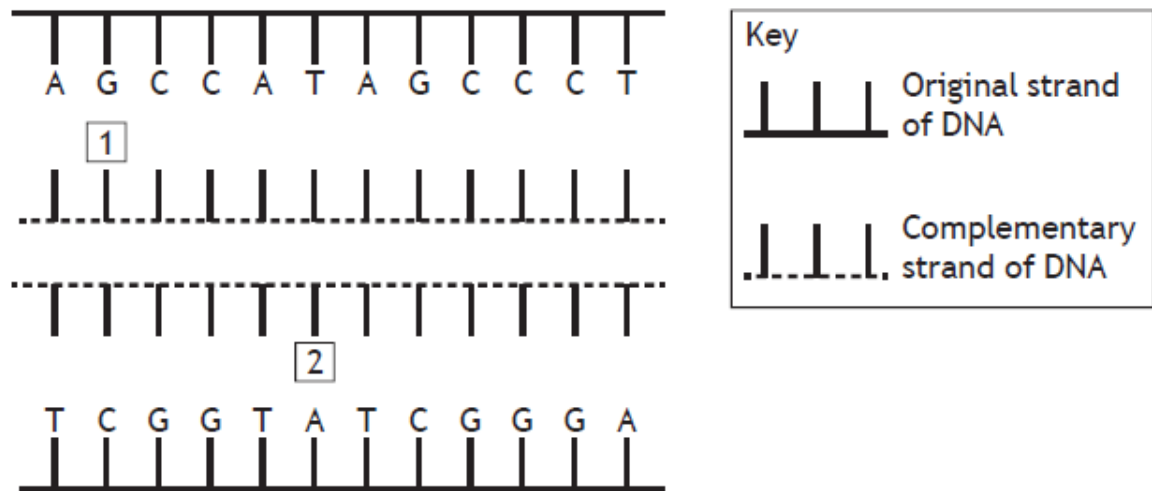
- (b) The genetic information is encoded in DNA molecules. Describe the structure of a DNA molecule.

3

- (c) DNA codes for the amino sequences in protein. Give two functions of proteins in cells.

2

- 4 (a) Forensic scientists can take small quantities of DNA and use a process to make large quantities. Each DNA molecule is separated and used to make two complementary strands as shown below.



Give the full names of bases labelled 1 and 2 in the diagram above.

2

1 _____

2 _____

- (b) The bases in a strand of DNA make up the code for the production of proteins. The DNA for every individual person varies.

Describe the way in which this code differs from person to person.

1

- (c) Name the single stranded molecule which carries a complementary copy of the code from the DNA in the nucleus to the ribosome for protein synthesis.

1

- d) State the name for a section of DNA that codes for a protein such as a hormone or enzyme.

1