

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

Mark: /40

Percentage: %

## SECTION A:

## MULTIPLE CHOICE

(5 marks)

Select the most correct answer for each question below.

1. DNA is made up of molecules called:

- (a) proteins.
- (b) genes.
- (c) chromosomes.
- ☒ (d) nucleotides.

2. Choose the incorrect statement about proteins.

- (a) Proteins control many characteristics and functions in the body.
- (b) Proteins include the structural materials that build up your cells and tissues.
- ☒ (c) Proteins are long threadlike structures found in the nucleus of cells.
- (d) Proteins make up most of the hormones in the human body.

3. The function of DNA is to:

- (a) allow the cells of a living thing to reproduce.
- (b) allow complementary nitrogen-rich bases to pair up.
- ☒ (c) store information on how a living thing's cells and body will work and look.
- (d) store nucleotides in the nucleus of a cell.

4. Each human cell has:

- (a) 23 chromosomes.
- (b) 42 chromosomes.
- ☒ (c) 46 chromosomes.
- (d) 43 chromosomes.

5. Choose the correct statement.

- (a) DNA strands have a special shape called a twisted ladder.
- (b) The nucleus is part of the cell that produces energy.
- (c) DNA is short for Designer Nucleic Acid
- ☒ (d) Chromosomes are tightly coiled DNA threads.

ANSWER KEY

## SECTION B:

## SHORT ANSWER

(35 marks)

1. State what the following letters represent in relation to DNA.

(4 marks)

A: Adenine (1) c: cytosine (1)  
 T: Thymine (1) G: Guanine (1)

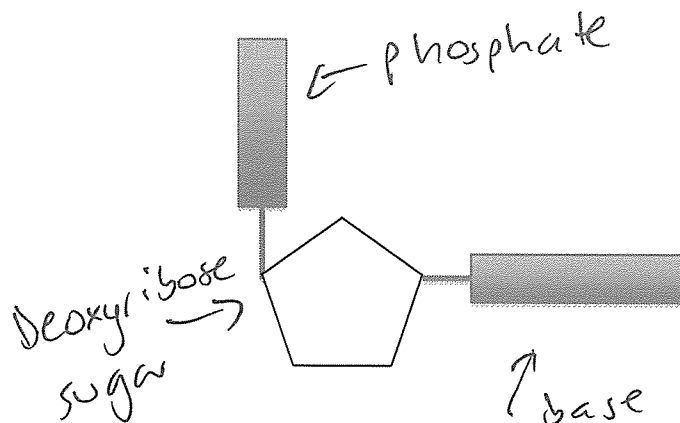
2. State what the initials DNA represent.

(1 mark)

Deoxyribonucleic acid

3. Label the diagram of the nucleotide below.

(3 marks)



4. The chemical structure of the nitrogen-rich bases means that they can only form chemical bonds with one of the other bases.

(2 mark)

Adenine only pairs with Thymine  
Cytosine only pairs with Guanine

5. Fill in the missing words.

(3 marks)

The cells in the human body each contain 46 chromosomes or 23 pairs.

The only exceptions are the sperm and egg cells which only contain 23 chromosomes and red blood cells which have no nucleus.

6. Write the complimentary DNA strand underneath each given strand of DNA. (4 marks)

a. C G T A A G C G C T A A T T A

G C A T T C G C G A T T A A T

b. T C T T A A A T G A T C G A T C

A G A A T T T A C T A G C T A G

c. A A T G A A T A G C T A G C T T

T T A C T T A T C G A T C G A A

d. G G C A T T C G C G A T C A T G

C C G T C C G C G C T A G T A C

7. Write definitions for the terms below. (4 marks)

Chromosome: <sup>(1)</sup> Tightly coiled threads of  
DNA  
(1)

Gene: <sup>(1)</sup> Sections <sup>(1)</sup> of DNA  
(1)

8. Describe where DNA is found in an organism. (2 marks)

DNA is located in the  
nucleus of cells.  
(1) (1)

9. Write the term under the correct definition.

(3 marks)

*Nitrogen-rich base, nucleotides, DNA, complementary base pair, phosphate group, deoxyribose sugar, proteins.*

The building blocks of DNA.

Nucleotides

(0.5)

One of the parts that make up a nucleotide.

phosphate group

(0.5)

Chemical compound that determines the genetic characteristics of most living things.

DNA

(0.5)

One of the parts that make up a nucleotide and has four types.

Nitrogen-rich base

(0.5)

Large molecules that control functions of the body.

proteins

(0.5)

One of the parts that make up a nucleotide.

deoxyribose sugar

(0.5)

A pair of bases that can join together.

complementary base pair

(0.5)

10. Genes are different to each other because of two reasons. Describe them below. (4 marks)

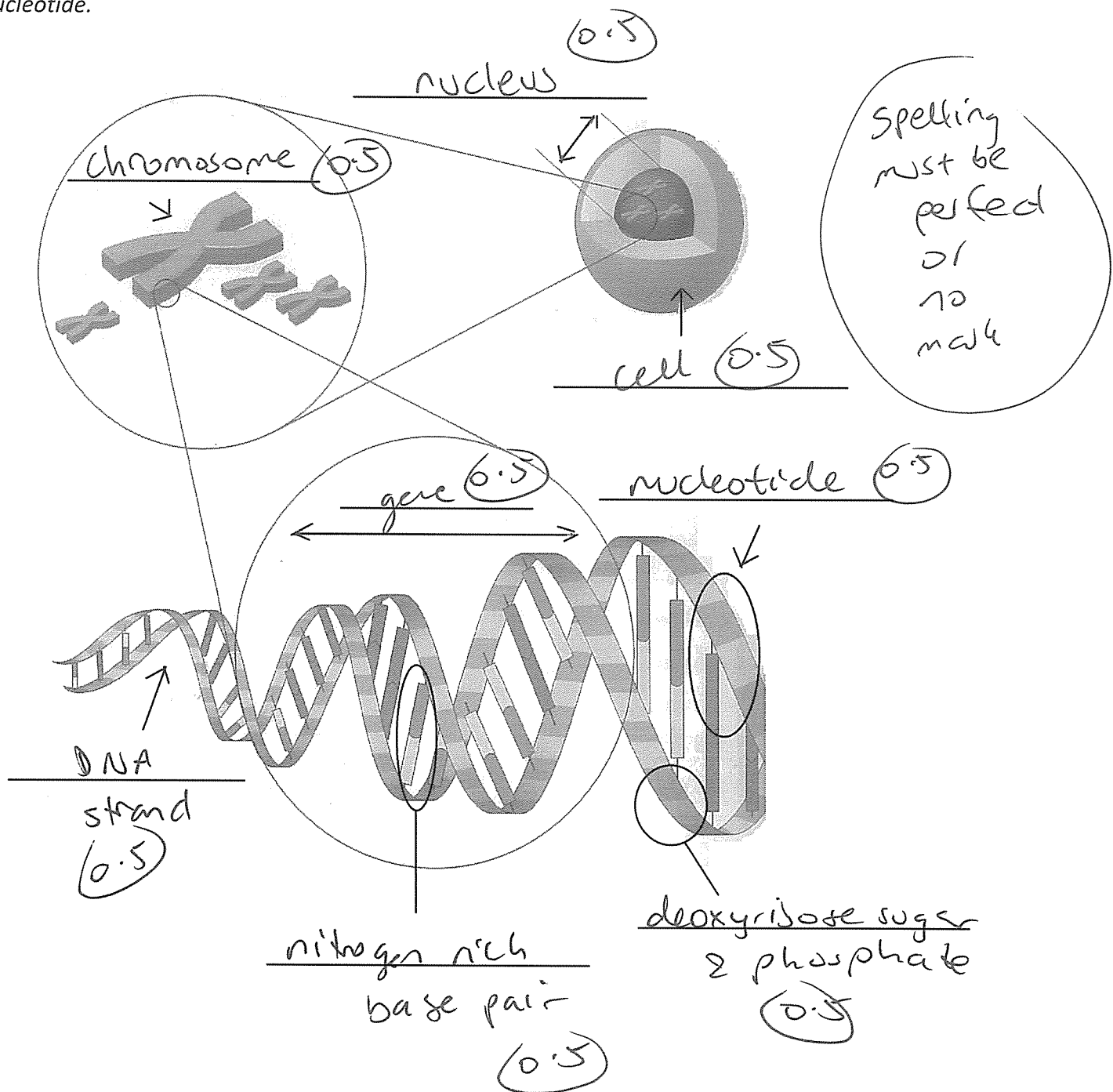
a. <sup>(1)</sup> order of bases along the DNA strand <sup>(1)</sup>

b. <sup>(1)</sup> length of the DNA strand <sup>(1)</sup>

11. Label the diagram below using the words provided.

(4 marks)

Cell, gene, DNA strand, nucleus, chromosome, deoxyribose sugar and phosphate, nitrogen rich base pair, nucleotide.



12. DNA strands have a special shape called a double helix (1 mark)