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BIOLOGY

GENETICS, BIODIVERSITY & CLASSIFICATION

Level & Board	AQA (A-LEVEL)
TOPIC:	DNA Genes and Chromosomes
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	7
TOTAL MARKS	30

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DNA, Genes and Chromosomes - 1

1.

(a) Locus/loci

(b)

- mRNA binds to ribosome
- Allows tRNA with anticodons to bind
- Catalyzes formation of polypeptide bond between amino acids

2.

(a) An exon is a region of the genome that ends up within an mRNA molecule. Some exons are coding, in that they contain information for making a protein, whereas others are non-coding. Genes in the genome consist of exons and introns.

(b) Serine, Alanine, Glycine, Proline

3.

(a) A phosphodiester bond occurs between nucleotides, monomers that build nucleic acid, to form the sugar-phosphate backbone. Phosphodiester bond formation occurs by the removal of a water molecule when 2 hydroxyl groups from 2 different sugars bond with a phosphate group, thus it is known as a condensation reaction.

(b)

$$G = 4(A + T) - C$$

guanine bases between gene = 168

$$168 = 4(A+T) - 168$$

2x

$$336 = 8x$$

$$X = 42$$

$$A+T = 42 \times 2 = 84$$

$$C+G = 336$$

$$(336 + 184) / 3 = 140$$

$$142 / 2 = 70$$

(c) Histone

4.

(a)

	DNA in the nucleus of a plant cell	DNA in a prokaryotic cell
1	Linear	Circular
2	Introns	No Introns
3	No Plasmid	Plasmids

(b) Non-coding base sequences are DNA that do not code for proteins and they are positioned between genes.

OR

- It's DNA that doesn't code for any proteins
- They are positioned between the genes

5.

(a)

- The nucleus and a chloroplast of a plant cell both contain DNA.
- Some DNA nucleotides have the organic base thymine, but RNA nucleotides do not have thymine.
- RNA nucleotides have uracil instead of thymine.

OR

In chloroplasts:

- DNA shorter
- DNA circular not linear
- Not associated with histone proteins unlike nuclear DNA

(b) DNA has deoxyribose pentose sugar, RNA has ribose pentose sugar.

(c)

W = amino acid binding site

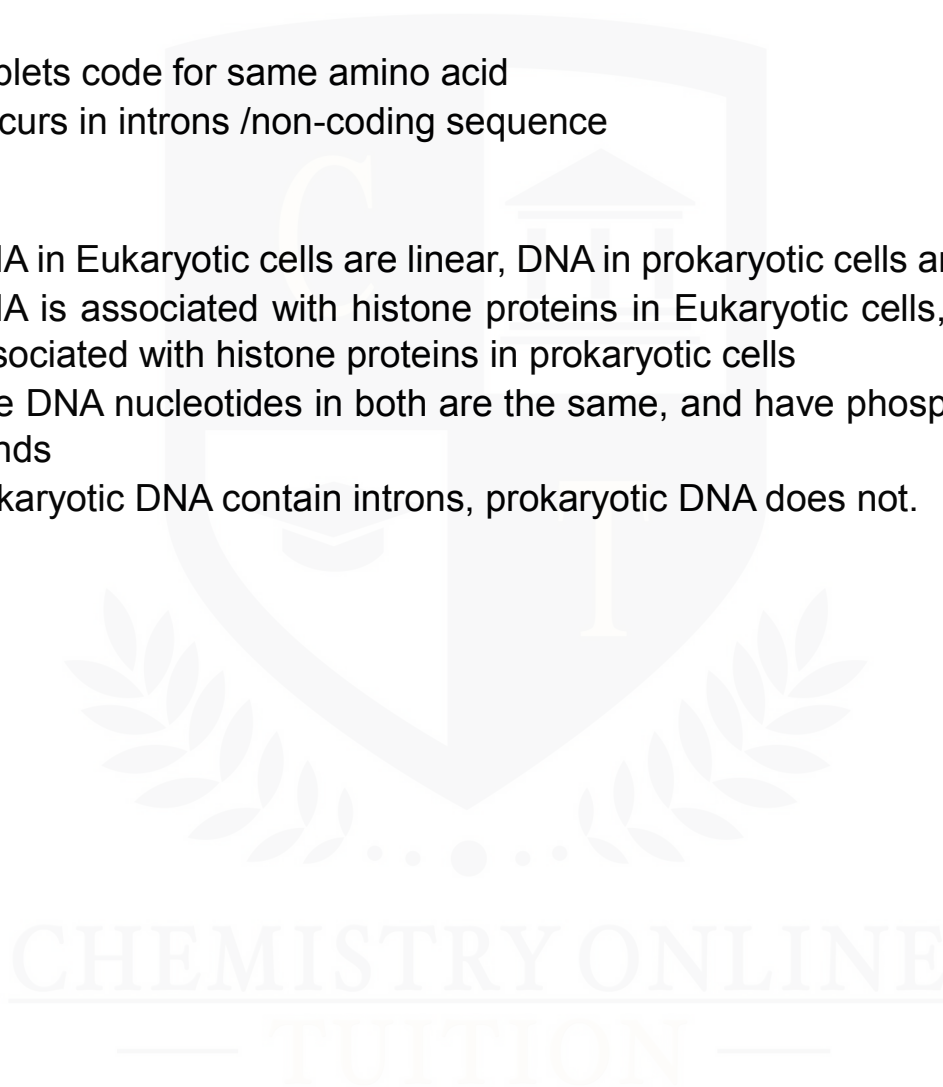
X = anticodon

(d)

- Triplets code for same amino acid
- Occurs in introns /non-coding sequence

(6)

- DNA in Eukaryotic cells are linear, DNA in prokaryotic cells are circular
- DNA is associated with histone proteins in Eukaryotic cells, DNA not associated with histone proteins in prokaryotic cells
- The DNA nucleotides in both are the same, and have phosphodiester bonds
- Eukaryotic DNA contain introns, prokaryotic DNA does not.



I am Sorry !!!!!