

GURU GOBIND SINGH PUBLIC SCHOOL

Biology Assignment

CLASS : XII

Important Terms Related To Chapter 6

1. Genome: Sum total of genes in haploid set of chromosomes.
2. Satellite DNA: The repetitive DNA sequences which form a large portion of genome and have high degree of polymorphism but do not code for any proteins.
3. DNA Polymorphism: The variations at genetic level, where an inheritable mutation is observed, in a population at high frequency.
4. Operon: A group of genes which control a metabolic pathway.
5. Introns: The regions of a gene which are removed during the processing of mRNA.
6. Exons: The regions of a gene which become part of mRNA and code for different regions of proteins.
7. Euchromatin: The region of chromatin which is loosely packed and transcriptionally active, it stains lighter.
8. Heterochromatin: The chromatin that is more densely packed, stains dark and is transcriptionally inactive.
9. Bioinformatics: Science of use of techniques including statistics, storing as data bases, analysing, modelling and providing access to various aspects of biological information usually on the molecular level.
10. Splicing: The process in eukaryotic genes in which introns are removed and the exons are joined together to form mRNA.

• Double-Helix Structure Of DNA

It is proposed by Watson and Crick in 1953.

- (i) DNA is made up of two polynucleotide chains.
- (ii) The backbone is made up of sugar and phosphate and the bases project inside.
- (iii) Both polynucleotide chains are antiparallel i.e. one chain has polarity 5'-3' and other chain has 3'-5'.
- (iv) These two strands of chains are held together by hydrogen bonds.
- (v) Both chains are coiled in right handed fashion. The pitch of helix is 3.4 nm with 10 base pairs in each turn.

1. Why does sickle-cell anaemia persist in the human population when it is believed that the harmful alleles get eliminated from the population after a certain time?

2. Describe the individuals with the following chromosomal abnormalities:

a) Trisomy at chromosome 21

b) XXY

c) XO

3. If a double stranded DNA has 20 per cent of cytosine, calculate the per cent of adenine in the DNA.

4. If the sequence of one strand of DNA is written as follows:

5'-ATGCATGCATGCATGCATGCATGC-3'

Write down the sequence of complementary strand in 5'→3' direction

5. If the sequence of the coding strand in a transcription unit is written as follows:

5'-ATGCATGCATGCATGCATGCATGC-3' Write down the sequence of mRNA.

6. Which property of DNA double helix led Watson and Crick to hypothesise semi- conservative mode of DNA replication? Explain.

7. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material?

8. Differentiate between the followings:

(a) Repetitive DNA and Satellite DNA

(b) mRNA and tRNA

(c) Template strand and Coding strand

9. In the medium where E. coli was growing, lactose was added, which induced the lac operon. Then, why does lac operon shut down some time after addition of lactose in the medium?

10. Explain (in one or two lines) the function of the followings:

(a) Promoter

(b) tRNA

(c) Exons