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Dept : BS MLT 3rd semester

Paper : Human Genetics

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Exam : summer Mid term

Date : 24/8/2020

QUESTION NO 1

- 1)** The tendency of offspring to resemble their parents is called **Heredity**
- 2)** **Gregor johan mendal** is known as the father of modern genetics
- 3)** Interphase chromatin consists of about **30-40 % DNA 50-60 %** protein and **1-10% RNA**
- 4)** A **nucleosome** is an organized structure of DNA and protein found in cells
- 5)** **Sister carotids** are two identical copies of chromosome connected by a centromere
- 6)** The region where two sister chromatids of chromosome appear to be joined during cell division is called **centrosome**
- 7)** The **Kinetochores** are the protein structures on chromosomes where the spindle fibers attach during cell division to pull the chromosome apart.
- 8)** **Histones** are unique features of eukaryotic chromosomes.

QUESTION NO 2 : write short notes on the following

- 1) Chromosome and gene**
- 2) Allele and forms of allele**
- 3) Genotype and phenotype**
- 4) Homozygous and heterozygous**
- 5) Centromere and telomere**

ANSWER: Chromosome: originated by Greek word (chroma, colour) (soma, body)

A chromosome is an organized structure of DNA and protein found in cells. It is a single piece of coiled DNA containing many genes. They are thread-like structures located inside the nucleus of animal and plant cells. Each chromosome is made of protein and a single molecule of deoxyribonucleic acid (DNA). Passed from parents to offspring, DNA contains the specific instructions that make each type of living creature unique.

Gene: The gene is the basic unit of inheritance; it is a segment within a very long strand of DNA with specific instructions for the production of one specific protein. A gene is located on a chromosome at its place or locus. A gene is transferred from parents to offspring and is used to determine some characteristics of the offspring.

Allele: Also called allelomorphs

Def: Alleles are alternate forms of a gene which occupy identical loci on homologous chromosomes.

Forms of Alleles: There are two different forms of alleles.

Dominant allele

Recessive allele

Genotype: The genetic makeup (constitution) of an organism.

Phenotype: The physical features / appearance of an organism

Homozygous: A condition in which both the members of an allelic pair in the homologous chromosome are identical (either dominant or recessive alleles)

Tall = TT

Dwarf = tt

Heterozygous: A condition in which the members of an allelic pair in the homologous chromosome are not identical (one dominant and one recessive allele).

Centromere: The region where two sister chromatids of a chromosome appear to be joined during cell division is called a centromere.

Also termed as constriction.

Darkly stained region.

In humans, the centromere contains 1-10 million base pairs of DNA.

First part of a chromosome to be seen moving towards the opposite poles during anaphase.

Telomere: Derived from the Greek nouns telos, "end" and meros "part"

A telomere is a region of repetitive DNA sequence at the end of a chromosome which protects the end of the chromosome from fusion with neighbouring chromosomes.

McClintock noticed that if two chromosomes were broken in a cell, the end of one could attach to the other and vice versa.

What is genetics? Discuss in detail the application of genetics ?

Genetics: have you ever wondered why you look like your parents and why your hair is blonde, black or brown ?

Do you know how a criminal can be caught using DNA fingerprinting ?

Genetics can be used to answer these questions

The study of genes

Genetics is about how and why physical characteristics such as eye colour are passed on from one generation to another.

About how diseases and conditions can run in families.

The study of patterns in genetic information such as the patterns used in DNA fingerprinting and profiling.

And genetics is about how variation occurs in and between animals, plants, or humans .

Application of genetics: Genetics affect us all in many ways

Genetics can help us to understand why people look the way they do and why some people are more prone to certain diseases than others.

Genetics can help health-care professionals to identify certain conditions in babies before they are born using techniques such as prenatal testing.

Genetic technologies are also being used to help develop targeted medicines for certain diseases.

In addition to its use in health care, genetics has a range of other applications.

For example; the police can use genetic fingerprinting to catch criminals.

Genetic fingerprinting was invented and developed by Sir Alec Jeffreys at the University of Leicester in 1984. This technique can identify individuals on the basis of their genetic information.

Criminals often leave traces of their identity at a crime scene; for example hair follicles, blood or skin cells. The police can use the genetic information to demonstrate whether or not an individual was present at the scene of a crime.

Genetic information can prove accusations and help to identify and convict the guilty.