

Mid-Term Assignment(Spring-2020) (BS-MLT 4th)

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Q1: Fill in the Blanks.

- 1) **James Watson** and **Francis Crick** discovered the double helical structure of the DNA molecule.
- 2) Watson and Crick were awarded Nobel Prize in **1962**.
- 3) **Nucleic acid** store, transmit, and help express hereditary information.
- 4) The amino acid sequence of a polypeptide is programmed by a unit of inheritance called a **gene**.
- 5) Hundreds of Y-shaped regions of replicating DNA molecules where new strands are growing called **Replication fork?**
- 6) **Topoisomerase** are enzyme which relieves stress on the DNA molecule by allowing free rotation around a single strand.
- 7) **Genetic code** is a dictionary that corresponds with sequence of nucleotides and sequence of amino acids.
- 8) **Charging** is the process of covalently attaching an amino acid to the tRNA.
- 9) **Single strand binding protein** are proteins which attach and help keep the separated strands apart.

Q2: Write short notes on the following

- 1) Common tools of molecular biology
Common tools of molecular biology:
 - i. DNA sequencing
 - ii. Reaction of polymerase chain
 - iii. Hybridization vectors probes.
 - iv. Molecular cloning
 - v. Nucleic acid enzymes

- vi. DNA sequencing
- vii. RNA northern blotting
- viii. Protein , immunohistochemistry western blotting.

2) **Nucleic acids**

Ans: **Nucleic acids:**

That store , transmit and they give help to express hereditary information..The nucleic acid is the biopolymers or small biomolecules essential life. That the overall name of the RNA and DNA.

They are composed of nucleotides they are monomers which make three components. Nitrogenous base , 5 carbon sugar and phosphate group.

3) **Chargaff's rule**

Ans: **Chargaff's rule:**

That state that of any cell of the organism should have base pair ratio 1:1 Ratio.

The amount of cytosine should be equal the guanine and amount of thymine is should be equal to adenine .

The thymine is pair of Adenine.

Cytosine is most pair of Guanine.

They given DNA molecule the amount will be same.

4) Wobble hypothesis

Ans **wobble hypothesis;**

The crick postulated to account of genetic code degeneracy .according to these hypothesis .the first two base of the codon pair and according to the normal base pair rule with last two bases of the anticodon.

Base pair at the third position of codon is wobble hypothesis.

5) Names of main steps in Translation and Transcription

Ans **.Names of steps of transcription:**

Definition: The formation of DNA from the mRNA is called transcription ,

STEPS

- 1 Initiation phase
- 2 Elongation phase or polymerization.
- 3 Termination phase.

Names of steps of translation:.

Definition: The formation of protein with help of RNA is called translation .

STEPS.

1 POLYPEPTIDE ELONGATION.

2 Formation of initiation complex.

3. **Termination.**

4 Activation of amino acid.

Q3: Explain the process of DNA Replication.

Ans **THE PROCESS OF DNA REPLICATION.**

Definition: They are the process which mean produced new molecular which have the same base sequence.

1 ORIGINS REPLICATION :

A. **Replication bubbles.** The replicating bubbles is hundreds of the eukaryotes.

Replication fork of the single with bacteria.

B **Replication forks:** The y shaped of hundreds regions of the DNA molecules which new strands are formed.

➤ **Strand separation.**

A. **Single strand binding protein:** which they attach to separated to help keep the strands apart .

B . **Helicase:** The breaks the H bonds of the parental double helix

C . **Topoisomerase:** The enzyme which stress on the DNA molecules by allowing free rotation around the single stand.

PRIMING:

A. **RNA primers:** That before strands DNA from the small primers pre existing and start the addition of the new nucleotide.

B. **Primase.** That enzyme that synthesizes the polymerizes the RNA primer .

➤ **SYNTHESIS NEW DNA STANDS.**

A. DNA polymerase .

With the DNA polymerase and the RNA and they synthesis of new stand DNA.

B. LEADING STRAND: The single polymer synthesized in the 5 to 3 direction.

C. Lagging strand: 5 to 3 also the synthesized direction but discontinuously overall direction of replication .

D. Okazaki fragments: The short form of the segments on the lagging strand .

E. DNA ligase: The enzyme of the catalyzes formation for the covalent bond the 3 and 5 .

F. Proofreading. The base pairing intinal errors are corrected usually by DNA polymerase.

GOOD LUCK.