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

**Course Title: Molecular Biology Instructor: Mr. Fazli Zahir Mian**

**Time: 48 Hours**

**Q1: Fill in the Blanks.**

1. \_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_ discovered the double helical structure of the DNA molecule.
2. Watson and Crick were awarded Nobel Prize in \_\_\_\_\_\_\_\_\_\_\_\_\_.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_store, transmit, and help express hereditary information.
4. The amino acid sequence of a polypeptide is programmed by a unit of inheritance called a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Hundreds of Y-shaped regions of replicating DNA molecules where new strands are growing called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_are enzyme which relieves stress on the DNA molecule by allowing free
7. rotation around a single strand.
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a dictionary that corresponds with sequence of nucleotides and sequence of amino acids.
9. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**is the process of covalently attaching an amino acid to the tRNA.
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are proteins which attach and help keep the separated strands apart.

**Q2: Write short notes on the following**

1. Common tools of molecular biology
2. Nucleic acids
3. Chargaff’s rule
4. Wobble hypothesis
5. Names of main steps in Translation and Transcription

**Q3:Explain the process of DNA Replication.**

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Good luck

Name :QASAR AFZAL

ID :14499

Qno1: Fill in the blank

1. James watoson and francis crick
2. 1962
3. DNA
4. GENE
5. Replication
6. TOPOISMERASE
7. GENETIC CODE
8. AMINOACYLATION
9. DNA HELICASE
10. SINGAl STANDED BINDING PROTEIN
11. REPLICATION

Qno 2 **Write short notes on the following**

1. Common tools of molecular biology
* Nucleic acid fractionation
* Polymerase chain reaction
* Probes,hybridizationvector,molecular cloning nucleie acid enzymes microarray
* Dna sequenceing
* Electrophoretic separation nuclueic acid detection of gens
* Dna souther blotting ,insitu hybridization;FISH technique
* Rna northern
* Protein western blotting immunohistochemsitry

 2 Nucleic acids

Nucleic acid were first isolated by Friedrich miesher (11869) from pus cells.

They were named nuclein.

Hertwing (1884) proposed nuclein to be the carrier of hereditary traits.

Because of their acidic nature they were named nucleic and then nuclic acids(Altmann1899)

Nucleic acid store transmit and help express hereditary information

The amino acid sequevcw of a polypeptide is programmed by a unit of inheritance called a gene

Gene are made of DNA anucleic acid made of minomers called nucleotides

3)Chargaff’s rule

Adenine must pair with thymine

Guanine must pair with cytosine

Their amounts in a given DNA molecule will ebe about the same.

4)Names of main steps in Translation and Transcription

TRANSLATION:

1. INITIATION:The two subunits of the ribosome come together and the start codon on the Mrna in the ribosom is aligned to set the reading frame.
2. ELONGATION:charged tRNAs attach and peptide bonds from brtween the amino acids.
3. TERMINATION

Transcription

Initiation

 elongation

Termination

6)Wobble hypothesis:

Crick postulated the wobble hypothesis to account for the dengerancy of genetic code.according this hypothesis,the first two bases of a codon pair according to the normalbase pairing rules with the last two bases of the anticodon.base parinig at the third position of a codon is wobble.

**Explain the process of DNA Replication.?**

**Ans :DNA is an essential molecule for life. Its acts like a recipe holding the instructions telling our bodies how to develop and function.**

**DNA MADE OF**

* **DNAis a long thin molecule made up of something called nucleotides**
* **Ther are four different types of nucleotides and.**
* **They are usually represented by their first letter:**
* **A –ADENINE**
* **T-THYMINE**
* **C-CYTOSINE**
* **G-GUANINE**

**DNA REPLICATION:**

**DNA replication is the pricess by which dna makes a copy of itself during cell division.**

**The dna molecule separates into two strands and then produces two new complementary stands following the rules of base paring .each strand of the bouble hellxof dna serves as atemplate or model for new strand.**

**DNA POLYMERASE:**

**ARE a family of enzymes that carry out all from of DNA Replication**

**STEOS OF REPLICATION**

**1.The first step in DNA replicatin is to unzip the double helix structure of the DNA molecule**

**2.this is carried out by an enzyme called helicase whoch breaks the hydrogen bonds holding the complementary bases of Dna together (Awith T,Cwith G)**

**The sepration of the two single strands of DNA creatss a ‘Y’shape called a replication frok’**

**The two serration strands wil act as templates for makingthe new stands of DNA.**

**ONE OF STANDS IS ORIENTRD IN THE 3 to 5 direction (toword the replication frok)this is the leading strand.**

**The other strand os oriented in the 5 to 3 direcation (away from the replication frok)this is the lagging strand.**

**As a result of their different orientation the two styrand are replication differently**

**Once all of the ases are matched up (a with T,C with G)an enzyme called exonuclesase strip away the primer(s)**

**The gaps where the primer (s) were are then filled by yet more complementary nucleotides.**

**The new strand is proofread to make sure there are no mistakes in the new Dna Sequance**

**DNA LIGASE:**

* **DNA ligase seals the nick between okazaki fragments converting them to a continuos strands of Dna**
* **Covalently close nick in doule stranded DNA.**
* **The result of DNA replication is two DNA molecules consisting of one new and one old chain of nucletiodes**
* **DNA REPLICATION PROCESS:**
* **DNA replication like all biological polymerization processes., proceds in three enyematicllty catalyzed and coordinating step**
* **Initiation**
* **Elongation**
* **Termination**

**DN REPLICATION INCLUDE**

**Initiation replication begins at an origin or replication**

**Elongation –new strands DNA are synthesized by DNA polymerase .**

**Termination replication is terminated differently in prokaryotes and eukaryotes**