

University of Al-Qadisyiah

Faculty of Biotechnology

Dept. of Agricultural Biotechnology



Subject: Molecular Biology 2

Time: Two hours

Stage: 2nd year

Final exam of second semester 2016-2017

Notice; Answer **Four** of the following questions **3**

Q. 1. Fill the following sentences with the correct answers? (10 marks)

- 1- **Proteins** are the principal determinants of an organism's characteristics.
- 2- Proteins contain one or more **polypeptide** chains which are, like nucleic acids, long polymers.
- 3- Sickle cell **anemia** is one of many convincing examples of the dependence of normal protein function on the correct primary and consequently the correct three-dimensional structure.
- 4 The story of sickle cell disease reveals the basic relation between **gene structure** and biological function.-
- 5- Prokaryotes, mainly the bacteria *E. coli*, provided the necessary experimental system for combined studies on **genetics** and biochemistry.

Q2. What are the BASIC STEPS OF GENE CLONING? (10 marks)

- Construction of recombinant DNA molecule
- Transport of the recombinant DNA to the host cell
- Multiplication of recombinant DNA molecule
- Division of the host cell
- Numerous cell division resulting in a clone

Q3 Explain the main Characteristics of PLASMID? (10 marks)

- They are small and contain 3-5 kb of DNA
- They contain suitable markers (antibiotic resistant)
- They contain suitable restriction sites that can be used for inserting DNA fragments for cloning

Q4. What are the Retroelements (10 Marks)

- transpose via RNA intermediates
- The RNA is copied by reverse transcriptase into DNA
- the DNA integrates into the genome
- Retroelements are found in all eukaryotes
- such as *Tos* in rice, *copia* in animals and *Ty1* in yeast