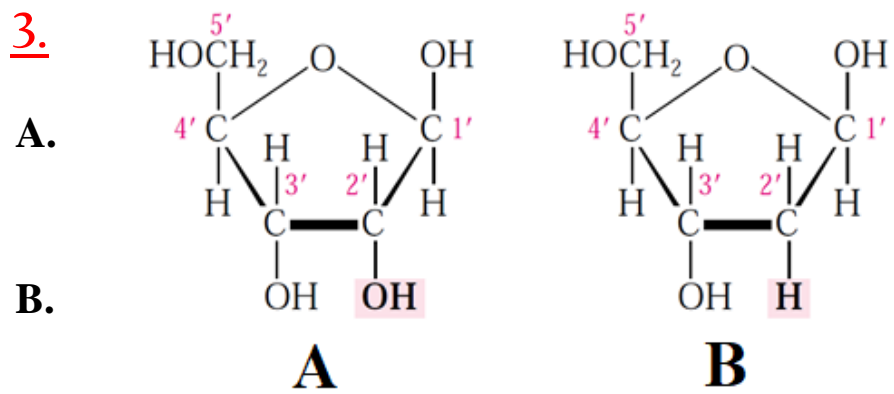
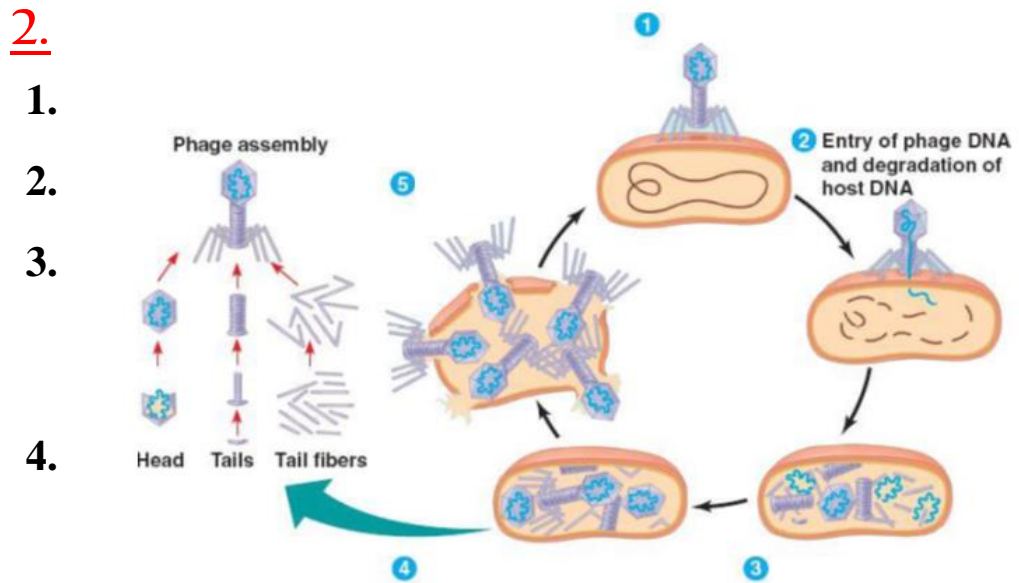
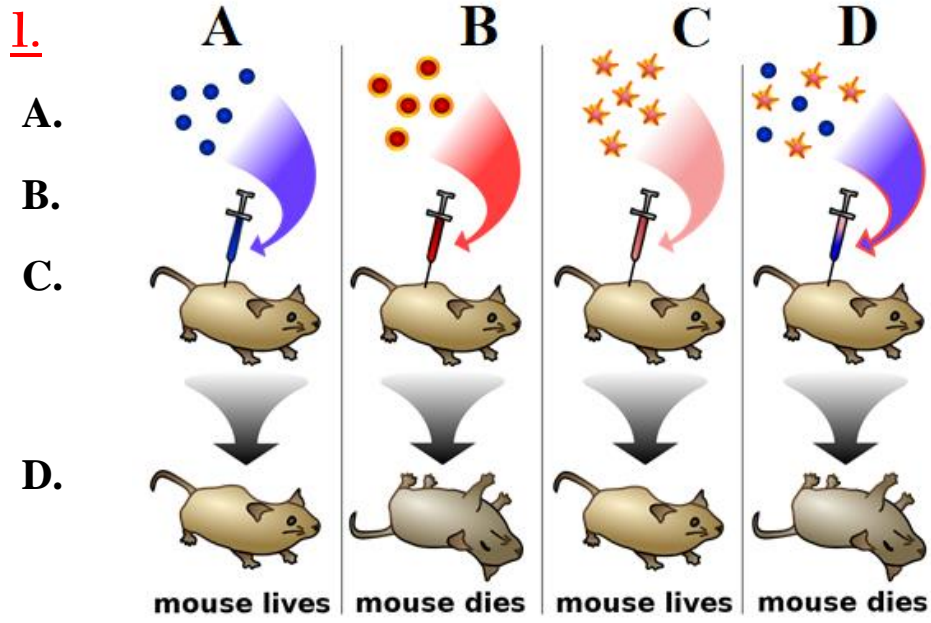


Question bank of Microbiology

Question: Fill the blanks with suitable words:

1. is the branch of biology that deals with the formation, structure, and function of macromolecules essential to life, such as nucleic acids and proteins, and especially with their role in cell replication and the transmission of genetic information.
2. Molecular biology is the study of molecular underpinnings of the processes of,, and
3. The of molecular biology where genetic material is transcribed into RNA and then translated into protein.
4. In 1952, and were the ones to conclusively prove that DNA is the genetic material.
5.,, and, together set out to determine the biochemical nature of the 'transforming principle' identified by Griffith.
6. The of DNA refers to its nucleotide structure and how the nucleotides are *joined* together.
7. The refers to DNA's stable three dimensional configuration, the helical structure worked out by Watson and Crick.
8. In, are the complexes packing arrangements of double stranded DNA in chromosomes.
9. The repeating units of DNA are nucleotides, each comprising three parts:,, and
10. is present in *both* DNA and RNA; however, is *restricted* to DNA, and is *found* only in RNA.
11. The double strands of DNA are held together by two types of molecular forces and
12. The *nature* of the hydrogen bond imposes a limitation on the types of bases that can pair. Adenine normally pairs only with thymine through bonds, and cytosine normally pairs only with guanine through bonds
13. The three dimensional structure of DNA that Watson and Crick described is termed the structure.
14. B-DNA is an *alpha* helix, meaning that it has a handed, or, It possesses approximately 10 base pairs per 360 degree rotation of the helix; so each base pair is twisted 36 degrees *relative* to the adjacent bases. The base pairs are nm apart; so each complete rotation of the molecule encompasses nm.

Question: Write the missing word from the following figures:

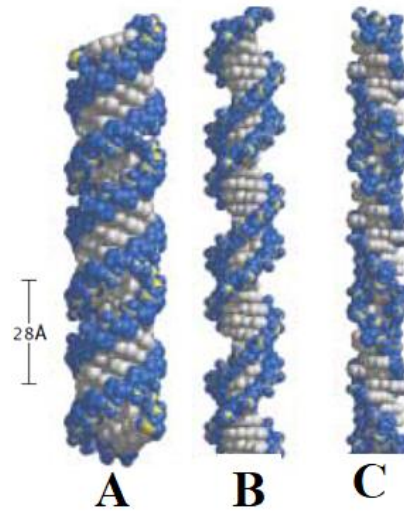


4.

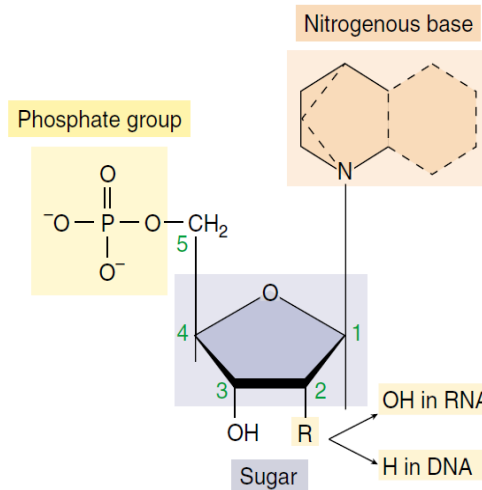
A.

B.

C.



5.



Question: Write briefly the properties of genetic material.

Question: Enumerate the following:

1. Requirements of Replication.
2. The enzymatic activities of DNA polymerase III enzyme.
3. Types of bacterial genes.
4. The major components of transcription.
5. Subunits of core RNA polymerase enzyme.

Question: Write the main differences between the following two concepts:

1. Leading strand and lagging strand.
2. The most obvious differences in DNA replication that eukaryotes distinguish from prokaryotes.
3. Core RNA polymerase and RNA polymerase holoenzyme.
4. Transcription initiation between prokaryotes and eukaryotes.
5. Two different strategies for transcription termination.

Question: Choose the best answer to complete the meaning of the following:

Question: Draw and label the following figures.

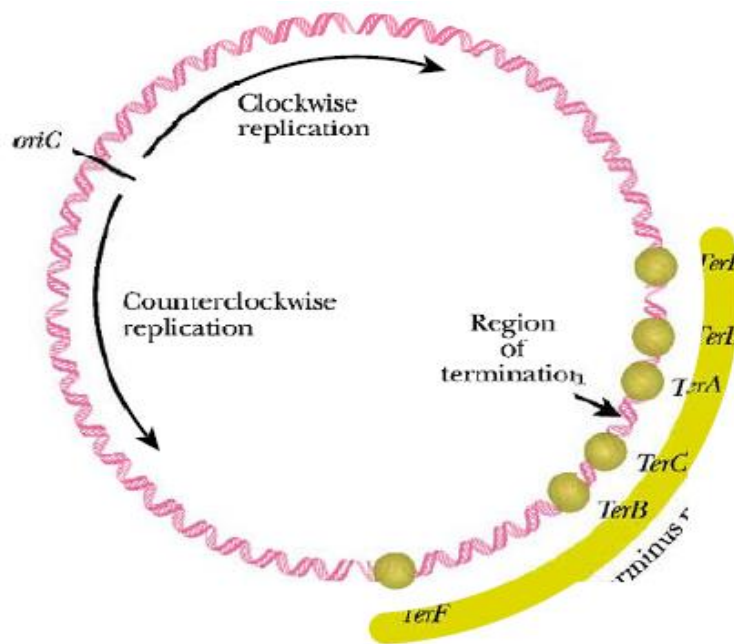
Question: Write the important differences in the structures of DNA and RNA.

Question: Enumerate each of the following statements in detail.

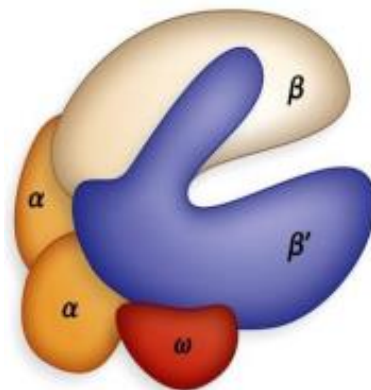
Question: Explain the Fredric Griffith experiment and write the main purpose of this experiment.

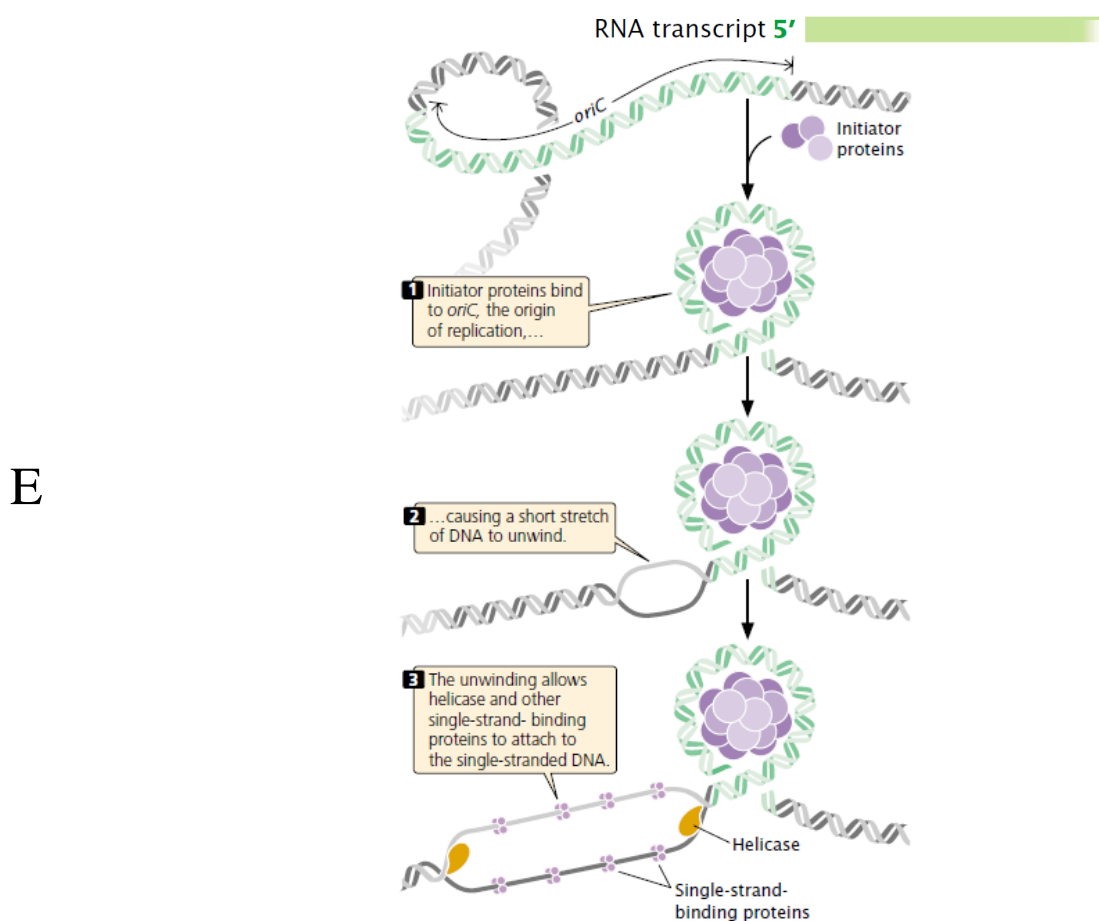
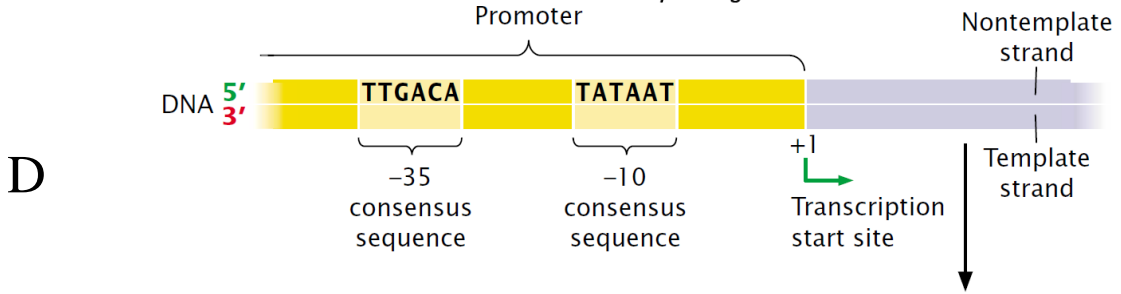
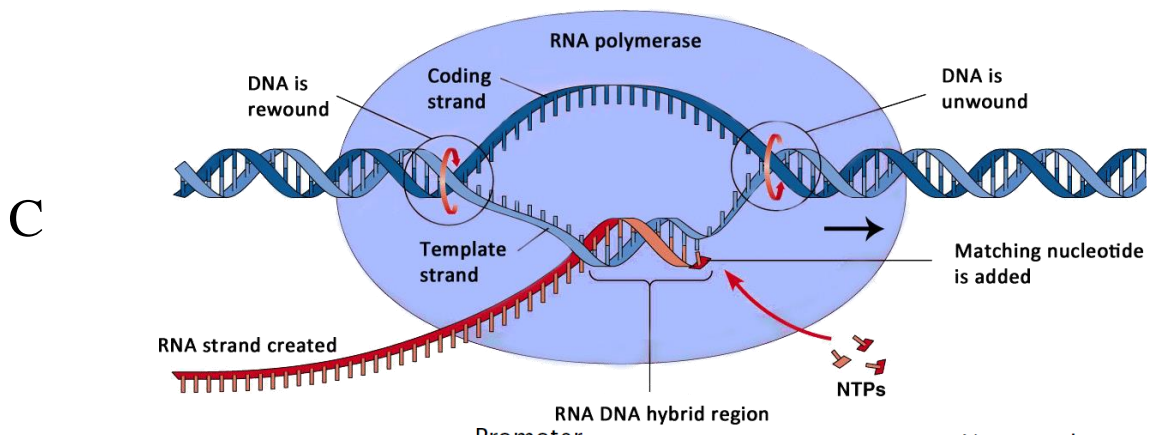
Question: Write the name of the process under the following pictures:

A



B





Question: Choose the best answer to complete the meaning of the following:

- An enzyme called synthesizes short stretches of primer nucleotides to get DNA replication started.
 - Helicase
 - Gyrase
 - Primase
- DNA + histone =
 - Chromosome
 - Chromatin
 - Nucleosome
- is found at the centromeres and telomeres of all chromosomes.

- A. Heterochromatin B. Euchromatin C. G-Band**
4. cannot initiate the unwinding of double-stranded DNA; the initiator proteins first separate DNA strands at the origin, providing a short stretch of single stranded DNA to which a helicase binds.
- A. Helicases B. DNA gyrase C. Primase**
5. In DNA's structures, are the complexes packing arrangements of double stranded DNA in chromosomes.
- A. Primary B. Secondary C. Tertiary**
6. On the leading strand, where DNA synthesis is....., a primer is required only at the 5' end of the newly synthesized strand.
- A. Discontinuous B. Dispersion C. Continuous**
7. The minimal sequence required for *oriC* to function consists of bp.
- A. 225 B. 235 C. 245**
8. The is a core particle consisting of DNA wrapped about two times around an octamer of eight histone proteins (two copies each of H₂A, H₂B, H₃, and H₄), much like *thread* wound around a *spool*.
- A. Chromosome B. Nucleosome C. Chromatin**
9. To stabilize the *single stranded* DNA long enough for replication to take place, attach tightly to the exposed single stranded DNA cover from 35 to 65 nucleotides.
- A. DNA polymerase B. Histone protein C. Single strand binding proteins**
10. with an attached amino acid is said to be "charged".
- A. rRNA B. tRNA C. mRNA**

Question: Fill the following blanks with the best word (s).

1. A is a unit of heredity in a living organism.
2. Although the DNA in each organism is unique, all DNA is composed of the same molecules.
3. In eukaryotes, DNA is housed within the, but in prokaryotes, DNA is located directly within the
4. Many bacteria contain *additional* DNA in the form of small circular molecules called, which *replicate* independently of the chromosome.
5. Phosphate groups are found in every nucleotide and frequently carry a negative charge, which makes DNA
6. The second component of a nucleotide is its *nitrogenous base*, which may be of two types a or a
7. The secondary structure refers to DNA's stable three dimensional configuration, the helical structure worked out by and
8. The third component of a nucleotide is the, which consists of a phosphorus atom bonded to four oxygen atoms.
9. The three dimensional structure of DNA that Watson and Crick described is termed the structure.

10. The two polynucleotide strands of a DNA molecule are therefore *not* but are

Question: Draw and label the following figures.

1. Nucleotide.
2. Histone protein.
3. Cell cycle.
4. Prokaryotic mRNA
5. Eukaryotic mRNA.

Question: Write the important differences in the structures of DNA and RNA.

Question: Enumerate each of the following statements in detail.

1. The most important characteristics of genetic material.
2. The primary structure of DNA.
3. The primary functions of chromatin.
4. The basic types of chromatin.
5. The major components transcription.
6. Both prokaryotic and eukaryotic mRNAs contain three primary regions

Question: Explain the Fredric Griffith experiment and write the main purpose of this experiment.

Assist Prof. Dr. Rebwar M. Hamasalih
Microbiology Lecturer