**Ch. 16 Warm--Up**

1) In his transformation experiments, what did **Griffith** observe?

A) Mutant mice were resistant to bacterial infections.

B) Mixing a heat-killed pathogenic strain of bacteria with a living nonpathogenic strain can convert some of the living cells into the pathogenic form.

C) Mixing a heat-killed nonpathogenic strain of bacteria with a living pathogenic strain makes the pathogenic strain nonpathogenic.

D) Infecting mice with nonpathogenic strains of bacteria makes them resistant to pathogenic strains.

E) Mice infected with a pathogenic strain of bacteria can spread the infection to other mice.

2) How do we describe transformation in bacteria?

A) the creation of a strand of DNA from an RNA molecule

B) the creation of a strand of RNA from a DNA molecule

C) the infection of cells by a phage DNA molecule

D) the type of semiconservative replication shown by DNA

E) assimilation of external DNA into a cell

3) In trying to determine whether DNA or protein is the genetic material, **Hershey and Chase** made use of which of the following facts?

A) DNA contains sulfur, whereas protein does not.

B) DNA contains phosphorus, whereas protein does not.

C) DNA contains nitrogen, whereas protein does not.

D) DNA contains purines, whereas protein includes pyrimidines.

E) RNA includes ribose, whereas DNA includes deoxyribose sugars.

4) Which of the following investigators was/were responsible for the following discovery?

In DNA from any species, the amount of adenine equals the amount of thymine, and the amount of guanine equals the amount of cytosine.

A) Frederick Griffith

B) Alfred Hershey and Martha Chase

C) Oswald Avery, Maclyn McCarty, and Colin MacLeod

D) Erwin Chargaff

E) Matthew Meselson and Franklin Stahl

5) Cytosine makes up 42% of the nucleotides in a sample of DNA from an organism. Approximately what percentage of the nucleotides in this sample will be thymine?

A) 8%

B) 16%

C) 31%

D) 42%

E) It cannot be determined from the information provided.

6) It became apparent to **Watson and Crick** after completion of their model that the DNA molecule could carry a vast amount of hereditary information in which of the following?

A) sequence of bases

B) phosphate-sugar backbones

C) complementary pairing of bases

D) side groups of nitrogenous bases

E) different five-carbon sugars

7) In an analysis of the nucleotide composition of DNA, which of the following will be found?

A) A = C

B) A = G and C = T

C) A + C = G + T

D) G + C = T + A

8) Replication in prokaryotes differs from replication in eukaryotes for which of the following reasons?

A) Prokaryotic chromosomes have histones, whereas eukaryotic chromosomes do not.

B) Prokaryotic chromosomes have a single origin of replication, whereas eukaryotic chromosomes have many.

C) The rate of elongation during DNA replication is slower in prokaryotes than in eukaryotes.

D) Prokaryotes produce Okazaki fragments during DNA replication, but eukaryotes do not.

E) Prokaryotes have telomeres, and eukaryotes do not.

9) What is meant by the description "**antiparallel**" regarding the strands that make up DNA?

A) The twisting nature of DNA creates nonparallel strands.

B) The 5' to 3' direction of one strand runs counter to the 5' to 3' direction of the other strand.

C) Base pairings create unequal spacing between the two DNA strands.

D) One strand is positively charged and the other is negatively charged.

E) One strand contains only purines and the other contains only pyrimidines.

10) Which enzyme catalyzes the elongation of a DNA strand in the 5' → 3' direction?

A) primase

B) DNA ligase

C) DNA polymerase III

D) topoisomerase

E) helicase

11) What is the function of **DNA polymerase III**?

A) to unwind the DNA helix during replication

B) to seal together the broken ends of DNA strands

C) to add nucleotides to the 3' end of a growing DNA strand

D) to degrade damaged DNA molecules

E) to rejoin the two DNA strands (one new and one old) after replication

12) The **leading** and the **lagging** **strands** differ in that

A) the leading strand is synthesized in the same direction as the movement of the replication fork, and the lagging strand is synthesized in the opposite direction.

B) the leading strand is synthesized by adding nucleotides to the 3' end of the growing strand, and the lagging strand is synthesized by adding nucleotides to the 5' end.

C) the lagging strand is synthesized continuously, whereas the leading strand is synthesized in short fragments that are ultimately stitched together.

D) the leading strand is synthesized at twice the rate of the lagging strand.

13) A new DNA strand elongates only in the 5' to 3' direction because

A) DNA polymerase begins adding nucleotides at the 5' end of the template.

B) Okazaki fragments prevent elongation in the 3' to 5' direction.

C) the polarity of the DNA molecule prevents addition of nucleotides at the 3' end.

D) replication must progress toward the replication fork.

E) DNA polymerase can only add nucleotides to the free 3' end.

14) Which of the following help(s) to hold the DNA strands apart while they are being replicated?

A) primase

B) ligase

C) DNA polymerase

D) single-strand binding proteins

E) exonuclease

15) In a **nucleosome**, the DNA is wrapped around

A) polymerase molecules.

B) ribosomes.

C) histones.

D) a thymine dimer.

E) satellite DNA.