Chapter 11: Mechanisms of Microbial Genetics

*** = Correct answer**

Multiple Choice

1. Gene expression includes which of the following?
   A. DNA replication
   B. replication, transcription, and translation
   C. transcription and translation*
   D. translation only

   Difficulty: Easy
   ASM Standard: N/A

2. The central dogma describes which of the following?
   A. the process by which enzymes are modified after translation
   B. the steps of gene expression*
   C. the way DNA is replicated
   D. the way RNA is used as a template to make DNA

   Difficulty: Easy
   ASM Standard: N/A

3. During bacterial DNA replication, which of the following holds open the replication bubble?
   A. DNA polymerases
   B. helicases
   C. primers
   D. single-strand binding proteins*

   Difficulty: Easy
   ASM Standard: N/A

4. Telomeres found in which of the following?
   A. all microbes
   B. animal cells only, not in unicellular organisms
   C. fungal, protist, plant, and animal chromosomes*
   D. microbes only, including all domains

   Difficulty: Easy
   ASM Standard: 16

5. Which of the following best describes the direction in which lagging strands are added?
   A. as 5′ to 3′ Okazaki fragments in an overall 3′ to 5′ direction only*
   B. as 5′ to 3′ Okazaki fragments in an overall 5′ to 3′ direction only
   C. in the 3′ to 5′ or 5′ to 3′ direction

D. in variable directions depending on the species

Difficulty: Easy
ASM Standard: N/A

6. Which of the following correctly describes uracil and where is it found?
   A. It is a nitrogenous base found in DNA and RNA.
   B. It is a nitrogenous base found in DNA only.
   C. It is a nitrogenous base found in RNA only.*
   D. It is a nitrogenous base found only in nucleotides of molecules other than RNA and DNA.

   Difficulty: Easy
   ASM Standard: N/A

7. Which of the following is another name for the template strand (the strand of DNA that is transcribed)?
   A. anticodon strand
   B. antisense strand*
   C. sense strand
   D. transcription strand

   Difficulty: Moderate
   ASM Standard: N/A

8. Which of the following correctly describes events that occur during transcription?
   A. DNA polymerase binds to the site of initiation.
   B. RNA polymerase binds to the core enzyme.
   C. RNA polymerase binds to the operator.
   D. RNA polymerase binds to the promoter.*

   Difficulty: Easy
   ASM Standard: N/A

9. Which of the following correctly explains why DNA replication is described as semiconservative?
   A. Each daughter strand contains one old strand and one new strand.*
   B. Each daughter strand contains two new strands.
   C. The nucleotides used in replication are recycled multiple times.
   D. The nucleotides used in replication contain old and new components.

   Difficulty: Moderate
   ASM Standard: N/A

10. During DNA replication in bacteria, which of the following enzymes adds DNA nucleotides to the growing strand?
    A. DNA polymerase I

B. DNA polymerase II
C. DNA polymerase III*
D. DNA polymerase IV

Difficulty: Moderate
ASM Standard: 16

11. Topoisomerase II in bacteria is also called which of the following?
A. gyrase*
B. helicase
C. primase
D. topoisomerase β

Difficulty: Moderate
ASM Standard: 16

12. DNA polymerase III adds DNA nucleotides in which of the following direction(s)?
A. in the 3′ to 5′ direction only
B. in the 3′ to 5′ direction and in 5′ to 3′ direction
C. in the 5′ to 3′ direction on one strand and in the 3′ to 5′ direction on the complementary strand
D. in the 5′ to 3′ direction only*

Difficulty: Moderate
ASM Standard: 16

13. Which of the following removes the primers during DNA replication in bacteria?
A. DNA polymerase I*
B. DNA polymerase II
C. DNA polymerase III
D. DNA polymerase IV

Difficulty: Moderate
ASM Standard: 16

14. The noncoding, repetitive sequences at the end of eukaryotic chromosomes are called which of the following?
A. bubbles
B. forks
C. lagging strands
D. telomeres*

Difficulty: Easy
ASM Standard: 16

15. During DNA replication, the lagging strand is formed from which of the following?