

Botany 101 - Fall 2004 - Exam III - Form A

Each correct answer is worth two (2) points, so 50 correct answers will score 100 points. There are five (5) extra credit questions (#51 to #55), each worth two points, which will be scored as bonus points.

1. True or False? The first law of thermodynamics states that: "Energy can neither be created nor destroyed but can be converted from one form to another."
 - a. True
 - b. False

2. By which of the following oxidative respiratory processes is glucose catabolized to yield *two* C₃ molecules?:
 - a. glycolysis
 - b. acetyl-CoA synthesis
 - c. Krebs cycle
 - d. Hatch-Slack pathway
 - e. electron transport chain

3. Which of the following is the C₃ molecule, produced by the process mentioned in question 2, that moves from the cytoplasm to an organelle?:
 - a. pyruvate
 - b. malate
 - c. 3PGA (3-phosphoglyceric acid)
 - d. dihydroxyacetone phosphate
 - e. glycerol

4. Which of the following is **not** considered to be a major step in aerobic respiration?:
 - a. acetyl CoA synthesis
 - b. the electron transport chain
 - c. fermentation
 - d. glycolysis
 - e. the citric acid cycle

5. In which of the following steps of oxidative respiration is a carbon (C) atom from glucose *first* released as CO₂ ?
 - a. glycolysis
 - b. the electron transport chain
 - c. acetyl CoA synthesis
 - d. glycolysis
 - e. the citric acid cycle

6. Which of the following organic bases is a **purine**?:
 - a. adenine
 - b. cytosine
 - c. uracil
 - d. thymine

7. Which of the following sugars is a major component of RNA?:
- glucose
 - fructose
 - ribose
 - deoxyribose
 - sucrose
8. When CO₂ becomes limiting, some plants use oxygen and give off CO₂ in a light-dependent process called:
- photoassimilation
 - photoamelioration
 - photosynthesis
 - photorespiration
 - photodegradation
9. What process is depicted in Figure 1?
- aminoacylation
 - transcription
 - replication
 - translation
 - trepidation
10. Typically, in what phase of the cell cycle does the process shown in Figure 1 occur?
- prophase
 - anaphase
 - G1
 - G2
 - S
11. In Figure 1, which arrow points to the *nascent leading strand*?
- B
 - C
 - D
 - E
 - F
12. In Figure 1, which arrow points to an *Okazaki fragment*?
- B
 - C
 - D
 - E
 - F

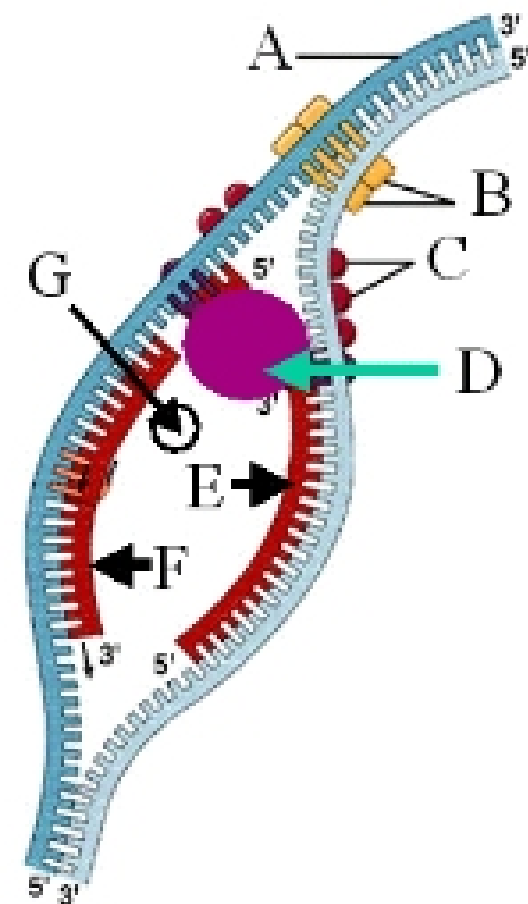


Figure 1

13. Three of the following four scientists who pioneered the structure of DNA were awarded the Nobel Prize. Who did NOT get a Nobel Prize?
- Rosalind Franklin
 - Francis Crick
 - James Watson
 - Maurice Wilkins

14. In the nucleus, DNA is wrapped around basic proteins called _____ to form _____
- histones; nucleoli
 - histones; chromatin
 - hormones; kinetin
 - histones; kinetin
 - globulins; nucleosomes

15. Fig. 2 shows a diagram of a gene. Which letter denotes the coding region?
- a
 - b
 - c
 - g
 - h

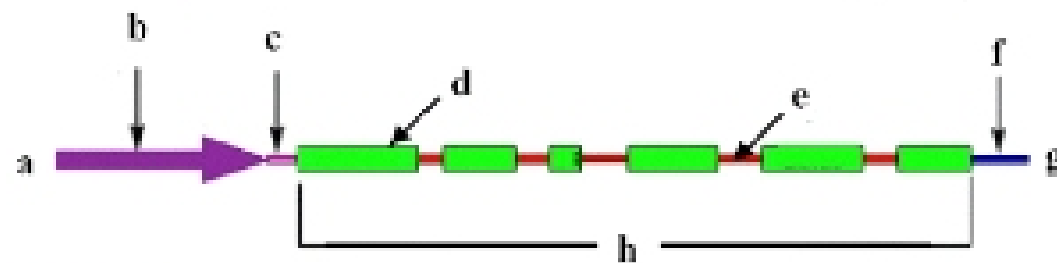


Figure 2

16. Fig. 2 shows a diagram of a gene. Arrow (b) points to the promoter. Which of the following functions is NOT a property of a promoter?
- Provides instructions for the amount of mRNA to be transcribed.
 - Provides instructions for where (in what tissues) the mRNA is to be transcribed.
 - Provides instructions for when (in what stage of development) the mRNA is to be transcribed.
 - Provides instructions for the position at which replication will begin.
17. Spacer DNA is the name given to the DNA between one nucleosome and the next. The length of this region is typically:
- 10 bp
 - 20 bp
 - 50 bp
 - 100 bp
 - 200 bp