AP DNA PrSyn Practice Test 2016

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. IN the genetioc code, a sequence of __ nucleotides in _____ constitutes a(n) _____, which specifies a particular amino acid.
a. two; mRNA; anticodon
b. three; tRNA; codon
c. three; DNA; codon
d. three; mRNA; codon
e. three; mRNA; anticodon

____ 2. The triplet nucleotide sequences that do not code for a specific amino acid are known as:
a. transcription factors
b. initiation codons
c. termination (stop) codons
d. frameshifts
e. elongation codons

____ 3. Which of the following was NOT a clue that RNA plays a role in the translation of genetic information from DNA into a polypeptide?
a. RNA is found in the cytoplasm of eukaryotic cells
b. In a variety of organisms, cells of developing embryos contain high levels of RNA
c. Many different kinds of RNA exist in the nucleus of a cell
d. Ribosomes are two-thirds RNA and one-third protein
e. RNA is synthesized from viral DNA before viral protein synthesis begins

____ 4. Given the mRNa sequence, (5') - AUGUACAAGGUCGGAUGA-(3'), which of the following amino acid sequences would result from translation?
a. tyr-met-val-lys-gly
b. met-tyr-lys-val-gly
c. gly-met-val-lys-tyr
d. met-val-lys-tyr-gly
e. ser-arg-leu-glu-his-val

____ 5. For a couple of decades, biologists knew the nucleus contained DNA and proteins. The prevailing opinion was that the genetic material was proteins, and not DNA. The reason for this belief was that proteins are more complex than DNA. What was the basis of this thinking?
a. Proteins have a greater variety of three-dimensional forms than does DNA.
b. Proteins have two different levels of structural organization; DNA has four.
c. Proteins are made of 40 amino acids and DNA is made of four nucleotides.
d. Some viruses only transmit proteins.
e. A and B are correct.

____ 6. 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.

____ 7. What does transformation involve 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

____ 8. 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, but protein does not.
c. DNA contains nitrogen, whereas protein does not.
d. DNA contains purines, whereas protein includes pyrimidines.
e. RNA includes ribose, while DNA includes deoxyribose sugars.

____ 9. For a science fair project, two students decided to repeat the Hershey and Chase experiment, with modifications. They decided to label the nitrogen of the DNA, rather than the phosphate. They reasoned that each nucleotide has only one phosphate and two to five nitrogens. Thus, labeling the nitrogens would provide a stronger signal than labeling the phosphates. Why won't this experiment work?
a. There is no radioactive isotope of nitrogen.
b. Radioactive nitrogen has a half-life of 100,000 years, and the material would be too dangerous for too long.
c. Avery et al. have already concluded that this experiment showed inconclusive results.
d. Although there are more nitrogens in a nucleotide, labeled phosphates actually have 16 extra neutrons; therefore, they are more radioactive.
e. Amino acids (and thus proteins) also have nitrogen atoms; thus, the radioactivity would not distinguish between DNA and proteins.

____ 10. When T2 phages infect bacteria and make more viruses in the presence of radioactive sulfur, what is the result?
a. The viral DNA will be radioactive.
b. The viral proteins will be radioactive.
c. The bacterial DNA will be radioactive.
d. both A and B
e. both A and C

____ 11. Chargaff's analysis of the relative base composition of DNA was significant because he was able to show that
a. the relative proportion of each of the four bases differs within individuals of a species.
b. the human genome is more complex than that of other species.
c. the amount of A is always equivalent to T, and C to G.
d. the amount of ribose is always equivalent to deoxyribose.

e. transformation causes protein to be brought into the cell.

____ 12. Which of the following can be determined directly from X-ray diffraction photographs of crystallized DNA*?*
a. the diameter of the helix
b. the rate of replication
c. the sequence of nucleotides
d. the bond angles of the subunits
e. the frequency of A vs. T nucleotides

____ 13. Why does the DNA double helix have a uniform diameter?
a. Purines pair with pyrimidines.
b. C nucleotides pair with A nucleotides.
c. Deoxyribose sugars bind with ribose sugars.
d. Nucleotides bind with nucleosides.
e. Nucleotides bind with nucleoside triphosphates.

____ 14. What kind of chemical bond is found between paired bases of the DNA double helix?
a. hydrogen
b. ionic
c. covalent
d. sulfhydryl
e. phosphate

____ 15. 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

____ 16. Mendel and Morgan did not know about the structure of DNA; however, which of the following of their contributions was (were) necessary to Watson and Crick?
a. the particulate nature of the hereditary material
b. dominance vs. recessiveness
c. sex-linkage
d. genetic distance and mapping
e. the usefulness of peas and *Drosophila*

____ 17. Replication in prokaryotes differs from replication in eukaryotes for which of these reasons?
a. The prokaryotic chromosome has 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.

____ 18. 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.

____ 19. Suppose you are provided with an actively dividing culture of *E. coli* bacteria to which radioactive thymine has been added. What would happen if a cell replicates once in the presence of this radioactive base?
a. One of the daughter cells, but not the other, would have radioactive DNA.
b. Neither of the two daughter cells would be radioactive.
c. All four bases of the DNA would be radioactive.
d. Radioactive thymine would pair with nonradioactive guanine.
e. DNA in both daughter cells would be radioactive.

Use Figure 16.1 to answer the following questions.

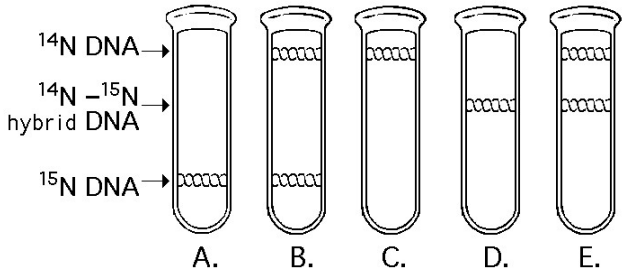


Figure 16.1

____ 20. Once the pattern found after one round of replication was observed, Meselson and Stahl could be confident of which of the following conclusions?
a. Replication is semi-conservative.
b. Replication is not dispersive.
c. Replication is not semi-conservative.
d. Replication is not conservative.
e. Replication is neither dispersive nor conservative.

____ 21. An Okazaki fragment has which of the following arrangements?
a. primase, polymerase, ligase
b. 3' RNA nucleotides, DNA nucleotides 5'
c. 5' RNA nucleotides, DNA nucleotides 3'
d. DNA polymerase I, DNA polymerase III
e. 5' DNA to 3'

____ 22. In *E. coli*, there is a mutation in a gene called dnaB that alters the helicase that normally acts at the origin. Which of the following would you expect as a result of this mutation?
a. No proofreading will occur.
b. No replication fork will be formed.
c. The DNA will supercoil.
d. Replication will occur via RNA polymerase alone.
e. Replication will require a DNA template from another source.

____ 23. 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

____ 24. What determines the nucleotide sequence of the newly synthesized strand during DNA replication?
a. the particular DNA polymerase catalyzing the reaction
b. the relative amounts of the four nucleoside triphosphates in the cell
c. the nucleotide sequence of the template strand
d. the primase used in the reaction
e. the arrangement of histones in the sugar phosphate backbone

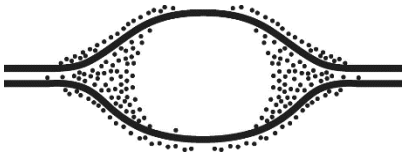
____ 25. Eukaryotic telomeres replicate differently than the rest of the chromosome. This is a consequence of which of the following?
a. The evolution of telomerase enzyme
b. DNA polymerase that cannot replicate the leading strand template to its 5' end
c. Gaps left at the 5' end of the lagging strand because of the need for a 3' onto which nucleotides can attach
d. Gaps left at the 3' end of the lagging strand because of the need for a primer
e. The "no ends" of a circular chromosome

____ 26. The enzyme telomerase solves the problem of replication at the ends of linear chromosomes by which method?
a. adding a single 5' cap structure that resists degradation by nucleases
b. causing specific double strand DNA breaks that result in blunt ends on both strands
c. causing linear ends of the newly replicated DNA to circularize
d. adding numerous short DNA sequences such as TTAGGG, which form a hairpin turn
e. adding numerous GC pairs which resist hydrolysis and maintain chromosome integrity

____ 27. The DNA of telomeres has been found to be highly conserved throughout the evolution of eukaryotes. What does this most probably reflect?
a. the inactivity of this DNA
b. the low frequency of mutations occurring in this DNA
c. that new evolution of telomeres continues
d. that mutations in telomeres are relatively advantageous

e. that the critical function of telomeres must be maintained

____ 28. In an experiment, DNA is allowed to replicate in an environment with all necessary enzymes, dATP, dCTP, dGTP, and radioactively labeled dTTP (^{3}H thymidine) for several minutes and then switched to nonradioactive medium. It is then viewed by electron microscopy and autoradiography. The drawing below represents the results.



Grains represent radioactive material within the replicating eye.

Figure 16.2

Which is the most likely interpretation?
a. There are two replication forks going in opposite directions.
b. Thymidine is only being added where the DNA strands are furthest apart.
c. Thymidine is only added at the very beginning of replication.
d. Replication proceeds in one direction only.

____ 29. Polytene chromosomes of *Drosophila* salivary glands each consist of multiple identical DNA strands that are aligned in parallel arrays. How could these arise?
a. replication followed by mitosis
b. replication without separation
c. meiosis followed by mitosis
d. fertilization by multiple sperm
e. special association with histone proteins

____ 30. To repair a thymine dimmer by nucleotide excision repair, in which order do the necessary enzymes act?
a. exonuclease, DNA polymerase III, RNA primase
b. helicase, DNA polymerase I, DNA ligase
c. DNA ligase, nuclease, helicase
d. DNA polymerase I, DNA polymerase III, DNA ligase
e. endonuclease, DNA polymerase I, DNA ligase

____ 31. 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 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

____ 32. You briefly expose bacteria undergoing DNA replication to radioactively labeled nucleotides. When you centrifuge the DNA isolated from the bacteria, the DNA separates into two classes. One class of labeled DNA includes very large molecules (thousands or even millions of nucleotides long), and the other includes short stretches of DNA (several hundred to a few thousand nucleotides in length). These two classes of DNA probably represent
a. leading strands and Okazaki fragments.
b. lagging strands and Okazaki fragments.
c. Okazaki fragments and RNA primers.
d. leading strands and RNA primers.
e. RNA primers and mitochondrial DNA.

____ 33. Which of the following removes the RNA nucleotides from the primer and adds equivalent DNA nucleotides to the 3' end of Okazaki fragments?
a. helicase
b. DNA polymerase III
c. ligase
d. DNA polymerase I
e. primase

____ 34. Which of the following separates the DNA strands during replication?
a. helicase
b. DNA polymerase III
c. ligase
d. DNA polymerase I
e. primase

____ 35. Which of the following covalently connects segments of DNA?
a. helicase
b. DNA polymerase III
c. ligase
d. DNA polymerase I
e. primase

____ 36. Which of the following synthesizes short segments of RNA?
a. helicase
b. DNA polymerase III
c. ligase
d. DNA polymerase I
e. primase

____ 37. The difference between ATP and the nucleoside triphosphates used during DNA synthesis is that
a. the nucleoside triphosphates have the sugar deoxyribose; ATP has the sugar ribose.
b. the nucleoside triphosphates have two phosphate groups; ATP has three phosphate groups.
c. ATP contains three high-energy bonds; the nucleoside triphosphates have two.
d. ATP is found only in human cells; the nucleoside triphosphates are found in all animal and plant cells.
e. triphosphate monomers are active in the nucleoside triphosphates, but not in ATP.

____ 38. 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.

____ 39. Which of the following best describes the addition of nucleotides to a growing DNA chain?
a. A nucleoside triphosphate is added to the 5' end of the DNA, releasing a molecule of pyrophosphate.
b. A nucleoside triphosphate is added to the 3' end of the DNA, releasing a molecule of pyrophosphate.
c. A nucleoside diphosphate is added to the 5' end of the DNA, releasing a molecule of phosphate.
d. A nucleoside diphosphate is added to the 3' end of the DNA, releasing a molecule of phosphate.
e. A nucleoside monophosphate is added to the 5' end of the DNA.

____ 40. 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.

____ 41. What is the function of topoisomerase?
a. relieving strain in the DNA ahead of the replication fork
b. elongation of new DNA at a replication fork by addition of nucleotides to the existing chain
c. the addition of methyl groups to bases of DNA
d. unwinding of the double helix
e. stabilizing single-stranded DNA at the replication fork

____ 42. What is the role of DNA ligase in the elongation of the lagging strand during DNA replication?
a. synthesize RNA nucleotides to make a primer
b. catalyze the lengthening of telomeres
c. join Okazaki fragments together
d. unwind the parental double helix
e. stabilize the unwound parental DNA

____ 43. Which of the following help 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

____ 44. Which would you expect of a eukaryotic cell lacking telomerase?
a. a high probability of becoming cancerous
b. production of Okazaki fragments
c. inability to repair thymine dimers
d. a reduction in chromosome length
e. high sensitivity to sunlight

____ 45. Which of the following sets of materials are required by both eukaryotes and prokaryotes for replication?
a. double-stranded DNA, 4 kinds of dNTPs, primers, origins
b. topoisomerases, telomerase, polymerases
c. G-C rich regions, polymerases, chromosome nicks
d. nucleosome loosening, 4 dNTPs, 4 rNTPs
e. ligase, primers, nucleases

____ 46. A typical bacterial chromosome has ~4.6 million nucleotides. This supports approximately how many genes?
a. 4.6 million
b. 4.4 thousand
c. 45 thousand
d. about 400

____ 47. In his work with pneumonia-causing bacteria and mice, Griffith found that
a. the protein coat from pathogenic cells was able to transform nonpathogenic cells.
b. heat-killed pathogenic cells caused pneumonia.
c. some substance from pathogenic cells was transferred to nonpathogenic cells, making them pathogenic.
d. the polysaccharide coat of bacteria caused pneumonia.
e. bacteriophages injected DNA into bacteria.

____ 48. *E. coli* cells grown on ^{15}N medium are transferred to ^{14}N medium and allowed to grow for two more generations (two rounds of DNA replication). DNA extracted from these cells is centrifuged. What density distribution of DNA would you expect in this experiment?
a. one high-density and one low-density band
b. one intermediate-density band
c. one high-density and one intermediate-density band
d. one low-density and one intermediate-density band
e. one low-density band

____ 49. A biochemist isolates and purifies various molecules needed for DNA replication. When she adds some DNA, replication occurs, but each DNA molecule consists of a normal strand paired with numerous segments of DNA a few hundred nucleotides long. What has she probably left out of the mixture?
a. DNA polymerase
b. DNA ligase
c. nucleotides
d. Okazaki fragments

e. primase

____ 50. What is the basis for the difference in how the leading and lagging strands of DNA molecules are synthesized?
a. The origins of replication occur only at the 5' end.
b. Helicases and single-strand binding proteins work at the 5' end.
c. DNA polymerase can join new nucleotides only to the 3' end of a growing strand.
d. DNA ligase works only in the 3' → 5' direction.
e. Polymerase can work on only one strand at a time.

____ 51. The elongation of the leading strand during DNA synthesis
a. progresses away from the replication fork.
b. occurs in the 3' → 5' direction.
c. produces Okazaki fragments.
d. depends on the action of DNA polymerase.
e. does not require a template strand.

____ 52. The spontaneous loss of amino groups from adenine results in hypoxanthine, an uncommon base, opposite thymine in DNA. What combination of molecules could repair such damage?
a. nuclease, DNA polymerase, DNA ligase
b. telomerase, primase, DNA polymerase
c. telomerase, helicase, single-strand binding protein
d. DNA ligase, replication fork proteins, adenylyl cyclase
e. nuclease, telomerase, primase

____ 53. In a nucleosome, the DNA is wrapped around
a. polymerase molecules.
b. ribosomes.
c. histones.
d. a thymine dimer.
e. satellite DNA.

The following questions refer to Figure 17.1, a simple metabolic pathway:

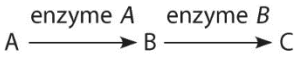


Figure 17.1

____ 54. According to Beadle and Tatum's hypothesis, how many genes are necessary for this pathway?
a. 0
b. 1
c. 2
d. 3
e. It cannot be determined from the pathway.

____ 55. A mutation results in a defective enzyme *A*. Which of the following would be a consequence of that mutation?
a. an accumulation of A and no production of B and C

b. an accumulation of A and B and no production of C
c. an accumulation of B and no production of A and C
d. an accumulation of B and C and no production of A
e. an accumulation of C and no production of A and B

____ 56. If A, B, and C are all required for growth, a strain that is mutant for the gene encoding enzyme *A* would be able to grow on which of the following media?
a. minimal medium
b. minimal medium supplemented with nutrient "A" only
c. minimal medium supplemented with nutrient "B" only
d. minimal medium supplemented with nutrient "C" only
e. minimal medium supplemented with nutrients "A" and "C"

____ 57. If A, B, and C are all required for growth, a strain mutant for the gene encoding enzyme *B* would be capable of growing on which of the following media?
a. minimal medium
b. minimal medium supplemented with "A" only
c. minimal medium supplemented with "B" only
d. minimal medium supplemented with "C" only
e. minimal medium supplemented with nutrients "A" and "B"

____ 58. The nitrogenous base adenine is found in all members of which group?
a. proteins, triglycerides, and testosterone
b. proteins, ATP, and DNA
c. ATP, RNA, and DNA
d. alpha glucose, ATP, and DNA
e. proteins, carbohydrates, and ATP

____ 59. Using RNA as a template for protein synthesis instead of translating proteins directly from the DNA is advantageous for the cell because
a. RNA is much more stable than DNA.
b. RNA acts as an expendable copy of the genetic material.
c. only one mRNA molecule can be transcribed from a single gene, lowering the potential rate of gene expression.
d. tRNA, rRNA and others are not transcribed.
e. mRNA molecules are subject to mutation but DNA is not.

____ 60. If proteins were composed of only 12 different kinds of amino acids, what would be the smallest possible codon size in a genetic system with four different nucleotides?
a. 1
b. 2
c. 3
d. 4
e. 12

____ 61. The enzyme polynucleotide phosphorylase randomly assembles nucleotides into a polynucleotide polymer. You add polynucleotide phosphorylase to a solution of adenosine triphosphate and guanosine triphosphate. How many artificial mRNA 3 nucleotide codons would be possible?

a. 3
b. 4
c. 8
d. 16
e. 64

___ 62. A particular triplet of bases in the template strand of DNA is 5' AGT 3'. The corresponding codon for the mRNA transcribed is
a. 3' UCA 5'.
b. 3' UGA 5'.
c. 5' TCA 3'.
d. 3'ACU 5'.
e. either UCA or TCA, depending on wobble in the first base.

The following questions refer to Figure 17.2, a table of codons.

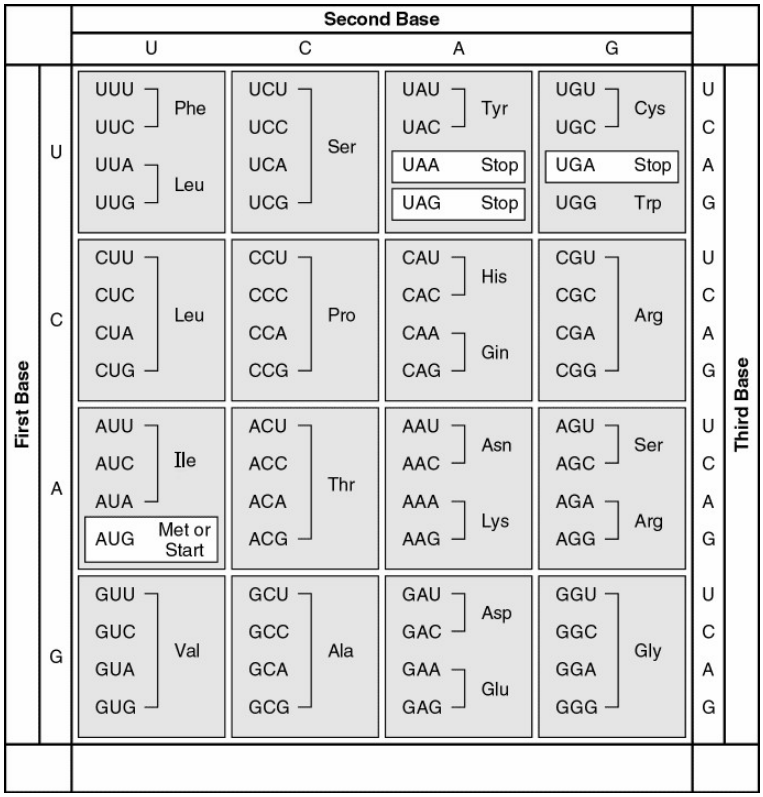


Figure 17.2

___ 63. A peptide has the sequence NH2-phe-pro-lys-gly-phe-pro-COOH. Which of the following sequences in the coding strand of the DNA could code for this peptide?
a. 3' UUU-CCC-AAA-GGG-UUU-CCC
b. 3' AUG-AAA-GGG-TTT-CCC-AAA-GGG
c. 5' TTT-CCC-AAA-GGG-TTT-CCC
d. 5' GGG-AAA-TTT-AAA-CCC-ACT-GGG

e. 5' ACT-TAC-CAT-AAA-CAT-TAC-UGA

____ 64. What is the sequence of a peptide based on the following mRNA sequence?
5' . . . UUUUCUUAUUGUCUU 3'
a. leu-cys-tyr-ser-phe
b. cyc-phe-tyr-cys-leu
c. phe-leu-ile-met-val
d. leu-pro-asp-lys-gly
e. phe-ser-tyr-cys-leu

____ 65. The genetic code is essentially the same for all organisms. From this, one can logically assume all of the following *except*
a. a gene from an organism could theoretically be expressed by any other organism.
b. all organisms have a common ancestor.
c. DNA was the first genetic material.
d. the same codons in different organisms usually translate into the same amino acids.
e. different organisms have the same number of different types of amino acids.

____ 66. The "universal" genetic code is now known to have exceptions. Evidence for this could be found if which of the following is true?
a. If UGA, usually a stop codon, is found to code for an amino acid such as tryptophan (usually coded for by UGG only).
b. If one stop codon, such as UGA, is found to have a different effect on translation than another stop codon, such as UAA.
c. If prokaryotic organisms are able to translate a eukaryotic mRNA and produce the same polypeptide.
d. If several codons are found to translate to the same amino acid, such as serine.
e. If a single mRNA molecule is found to translate to more than one polypeptide when there are two or more AUG sites.

____ 67. Which of the following nucleotide triplets best represents a codon?
a. a triplet separated spatially from other triplets
b. a triplet that has no corresponding amino acid
c. a triplet at the opposite end of tRNA from the attachment site of the amino acid
d. a triplet in the same reading frame as an upstream AUG
e. a sequence in tRNA at the 3' end

____ 68. Which of the following is *true* for both prokaryotic and eukaryotic gene expression?
a. After transcription, a 3' poly-A tail and a 5' cap are added to mRNA.
b. Translation of mRNA can begin before transcription is complete.
c. RNA polymerase binds to the promoter region to begin transcription.
d. mRNA is synthesized in the 3' $\rightarrow$ 5' direction.
e. The mRNA transcript is the exact complement of the gene from which it was copied.

____ 69. In which of the following actions does RNA polymerase differ from DNA polymerase?
a. RNA polymerase uses RNA as a template, and DNA polymerase uses a DNA template.

b. RNA polymerase binds to single-stranded DNA, and DNA polymerase binds to double-stranded DNA.
c. RNA polymerase is much more accurate than DNA polymerase.
d. RNA polymerase can initiate RNA synthesis, but DNA polymerase requires a primer to initiate DNA synthesis.
e. RNA polymerase does not need to separate the two strands of DNA in order to synthesize an RNA copy, whereas DNA polymerase must unwind the double helix before it can replicate the DNA.

____ 70. Which of the following statements best describes the termination of transcription in prokaryotes?
a. RNA polymerase transcribes through the polyadenylation signal, causing proteins to associate with the transcript and cut it free from the polymerase.
b. RNA polymerase transcribes through the terminator sequence, causing the polymerase to fall off the DNA and release the transcript.
c. RNA polymerase transcribes through an intron, and the snRNPs cause the polymerase to let go of the transcript.
d. Once transcription has initiated, RNA polymerase transcribes until it reaches the end of the chromosome.
e. RNA polymerase transcribes through a stop codon, causing the polymerase to stop advancing through the gene and release the mRNA.

____ 71. RNA polymerase moves in which direction along the DNA?
a. 3' $\rightarrow$ 5' along the template strand
b. 3' $\rightarrow$ 5' along the coding (sense) strand
c. 5' $\rightarrow$ 3' along the template strand
d. 3' $\rightarrow$ 5' along the coding strand
e. 5' $\rightarrow$ 3' along the double-stranded DNA

____ 72. RNA polymerase in a prokaryote is composed of several subunits. Most of these subunits are the same for the transcription of any gene, but one, known as sigma, varies considerably. Which of the following is the most probable advantage for the organism of such sigma switching?
a. It might allow the transcription process to vary from one cell to another.
b. It might allow the polymerase to recognize different promoters under certain environmental conditions.
c. It could allow the polymerase to react differently to each stop codon.
d. It could allow ribosomal subunits to assemble at faster rates.
e. It could alter the rate of translation and of exon splicing.

____ 73. Which of these is the function of a poly (A) signal sequence?
a. It adds the poly (A) tail to the 3' end of the mRNA.
b. It codes for a sequence in eukaryotic transcripts that signals enzymatic cleavage ~10—35 nucleotides away.
c. It allows the 3' end of the mRNA to attach to the ribosome.
d. It is a sequence that codes for the hydrolysis of the RNA polymerase.
e. It adds a 7-methylguanosine cap to the 3' end of the mRNA.

____ 74. In eukaryotes there are several different types of RNA polymerase. Which type is involved in transcription of mRNA for a globin protein?

a. ligase
b. RNA polymerase I
c. RNA polymerase II
d. RNA polymerase III
e. primase

____ 75. Transcription in eukaryotes requires which of the following in addition to RNA polymerase?
a. the protein product of the promoter
b. start and stop codons
c. ribosomes and tRNA
d. several transcription factors (TFs)
e. aminoacyl synthetase

____ 76. A part of the promoter, called the TATA box, is said to be highly conserved in evolution. Which might this illustrate?
a. The sequence evolves very rapidly.
b. The sequence does not mutate.
c. Any mutation in the sequence is selected against.
d. The sequence is found in many but not all promoters.
e. The sequence is transcribed at the start of every gene.

____ 77. The TATA sequence is found only several nucleotides away from the start site of transcription. This most probably relates to which of the following?
a. the number of hydrogen bonds between A and T in DNA
b. the triplet nature of the codon
c. the ability of this sequence to bind to the start site
d. the supercoiling of the DNA near the start site
e. the 3-dimensional shape of a DNA molecule

____ 78. What are the coding segments of a stretch of eukaryotic DNA called?
a. introns
b. exons
c. codons
d. replicons
e. transposons

____ 79. Once transcribed, eukaryotic mRNA typically undergoes substantial alteration that includes
a. union with ribosomes.
b. fusion into circular forms known as plasmids.
c. linkage to histone molecules.
d. excision of introns.
e. fusion with other newly transcribed mRNA.

____ 80. Introns are significant to biological evolution because
a. their presence allows exons to be shuffled.
b. they protect the mRNA from degeneration.
c. they are translated into essential amino acids.
d. they maintain the genetic code by preventing incorrect DNA base pairings.

e. they correct enzymatic alterations of DNA bases.

____ 81. A mutation in which of the following parts of a gene is likely to be most damaging to a cell?
a. intron
b. exon
c. 5' UTR
d. 3' UTR
e. All would be equally damaging.

____ 82. Which of the following is (are) true of snRNPs?
a. They are made up of both DNA and RNA.
b. They bind to splice sites at each end of the exon.
c. They join together to form a large structure called the spliceosome.
d. They act only in the cytosol.
e. They attach introns to exons in the correct order.

____ 83. During splicing, which molecular component of the spliceosome catalyzes the excision reaction?
a. protein
b. DNA
c. RNA
d. lipid
e. sugar

____ 84. In the structural organization of many eukaryotic genes, individual exons may be related to which of the following?
a. the sequence of the intron that immediately precedes each exon
b. the number of polypeptides making up the functional protein
c. the various domains of the polypeptide product
d. the number of restriction enzyme cutting sites
e. the number of start sites for transcription

____ 85. Each eukaryotic mRNA, even after post-transcriptional modification, includes 5' and 3' UTRs. Which are these?
a. the cap and tail at each end of the mRNA
b. the untranslated regions at either end of the coding sequence
c. the U attachment sites for the tRNAs
d. the U translation sites that signal the beginning of translation
e. the U — A pairs that are found in high frequency at the ends

____ 86. In an experimental situation, a student researcher inserts an mRNA molecule into a eukaryotic cell after he has removed its 5' cap and poly(A) tail. Which of the following would you expect him to find?
a. The mRNA could not exit the nucleus to be translated.
b. The cell recognizes the absence of the tail and polyadenylates the mRNA.
c. The molecule is digested by restriction enzymes in the nucleus.
d. The molecule is digested by exonucleases since it is no longer protected at the 5' end.
e. The molecule attaches to a ribosome and is translated, but more slowly.

____ 87. A particular triplet of bases in the coding sequence of DNA is AAA. The anticodon on the tRNA that binds the mRNA codon is
a. TTT.
b. UUA.
c. UUU.
d. AAA.
e. either UAA or TAA, depending on first base wobble.

____ 88. Accuracy in the translation of mRNA into the primary structure of a polypeptide depends on specificity in the
a. binding of ribosomes to mRNA.
b. shape of the A and P sites of ribosomes.
c. bonding of the anticodon to the codon.
d. attachment of amino acids to tRNAs.
e. both C and D

____ 89. What type of bonding is responsible for maintaining the shape of the tRNA molecule?
a. covalent bonding between sulfur atoms
b. ionic bonding between phosphates
c. hydrogen bonding between base pairs
d. van der Waals interactions between hydrogen atoms
e. peptide bonding between amino acids

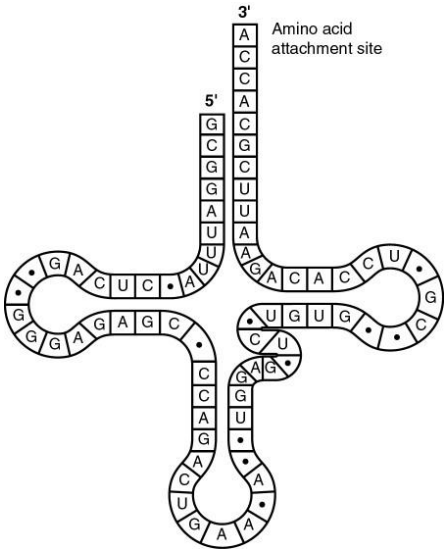


Figure 17.4

____ 90. Figure 17.4 represents tRNA that recognizes and binds a particular amino acid (in this instance, phenylalanine). Which codon on the mRNA strand codes for this amino acid?
a. UGG
b. GUG
c. GUA
d. UUC

e. CAU

____ 91. The tRNA shown in Figure 17.4 has its 3' end projecting beyond its 5' end. What will occur at this 3' end?
a. The codon and anticodon complement one another.
b. The amino acid binds covalently.
c. The excess nucleotides (ACCA) will be cleaved off at the ribosome.
d. The small and large subunits of the ribosome will attach to it.
e. The 5' cap of the mRNA will become covalently bound.

____ 92. There are 61 mRNA codons that specify an amino acid, but only 45 tRNAs. This is best explained by the fact that
a. some tRNAs have anticodons that recognize four or more different codons.
b. the rules for base pairing between the third base of a codon and tRNA are flexible.
c. many codons are never used, so the tRNAs that recognize them are dispensable.
d. the DNA codes for all 61 tRNAs but some are then destroyed.
e. competitive exclusion forces some tRNAs to be destroyed by nucleases.

____ 93. What is the most abundant type of RNA?
a. mRNA
b. tRNA
c. rRNA
d. pre-mRNA
e. hnRNA

____ 94. From the following list, which is the first event in translation in eukaryotes?
a. elongation of the polypeptide
b. base pairing of activated methionine-tRNA to AUG of the messenger RNA
c. the larger ribosomal subunit binds to smaller ribosomal subunits
d. covalent bonding between the first two amino acids
e. the small subunit of the ribosome recognizes and attaches to the 5' cap of mRNA

____ 95. Choose the answer that has these events of protein synthesis in the proper sequence.
1. An aminoacyl-tRNA binds to the A site.
2. A peptide bond forms between the new amino acid and a polypeptide chain.
3. tRNA leaves the P site, and the P site remains vacant.
4. A small ribosomal subunit binds with mRNA.
5. tRNA translocates to the P site.
a. 1, 3, 2, 4, 5
b. 4, 1, 2, 5, 3
c. 5, 4, 3, 2, 1
d. 4, 1, 3, 2, 5
e. 2, 4, 5, 1, 3

____ 96. As a ribosome translocates along an mRNA molecule by one codon, which of the following occurs?
a. The tRNA that was in the A site moves into the P site.
b. The tRNA that was in the P site moves into the A site.
c. The tRNA that was in the A site moves to the E site and is released.

d. The tRNA that was in the A site departs from the ribosome via a tunnel.
e. The polypeptide enters the E site.

____ 97. What are polyribosomes?
a. groups of ribosomes reading a single mRNA simultaneously
b. ribosomes containing more than two subunits
c. multiple copies of ribosomes associated with giant chromosomes
d. aggregations of vesicles containing ribosomal RNA
e. ribosomes associated with more than one tRNA

____ 98. Which of the following is a function of a signal peptide?
a. to direct an mRNA molecule into the cisternal space of the ER
b. to bind RNA polymerase to DNA and initiate transcription
c. to terminate translation of the messenger RNA
d. to translocate polypeptides across the ER membrane
e. to signal the initiation of transcription

____ 99. When translating secretory or membrane proteins, ribosomes are directed to the ER membrane by
a. a specific characteristic of the ribosome itself, which distinguishes free ribosomes from bound ribosomes.
b. a signal-recognition particle that brings ribosomes to a receptor protein in the ER membrane.
c. moving through a specialized channel of the nucleus.
d. a chemical signal given off by the ER.
e. a signal sequence of RNA that precedes the start codon of the message.

____ 100. When does translation begin in prokaryotic cells?
a. after a transcription initiation complex has been formed
b. as soon as transcription has begun
c. after the 5' caps are converted to mRNA
d. once the pre-mRNA has been converted to mRNA
e. as soon as the DNA introns are removed from the template

____ 101. When a tRNA molecule is shown twisted into an L shape, the form represented is
a. its linear sequence.
b. its 2-dimensional shape.
c. its 3-dimensional shape.
d. its microscopic image.

____ 102. An experimenter has altered the 3' end of the tRNA corresponding to the amino acid methionine in such a way as to remove the 3' AC. Which of the following hypotheses describes the most likely result?
a. tRNA will not form a cloverleaf.
b. The nearby stem end will pair improperly.
c. The amino acid methionine will not bind.
d. The anticodon will not bind with the mRNA codon.
e. The aminoacylsynthetase will not be formed.

Use the following information to answer the following questions.

A transfer RNA (#1) attached to the amino acid lysine enters the ribosome. The lysine binds to the growing polypeptide on the other tRNA (#2) in the ribosome already.

____ 103. Which enzyme causes a covalent bond to attach lysine to the polypeptide?
a. ATPase
b. lysine synthetase
c. RNA polymerase
d. ligase
e. peptidyl transferase

____ 104. Where does tRNA #2 move to after this bonding of lysine to the polypeptide?
a. A site
b. P site
c. E site
d. Exit tunnel
e. Directly to the cytosol

____ 105. Which component of the complex described enters the exit tunnel through the large subunit of the ribosome?
a. tRNA with attached lysine (#1)
b. tRNA with polypeptide (#2)
c. tRNA that no longer has attached amino acid
d. newly formed polypeptide
e. initiation and elongation factors

____ 106. The process of translation, whether in prokaryotes or eukaryotes, requires tRNAs, amino acids, ribosomal subunits, and which of the following?
a. polypeptide factors plus ATP
b. polypeptide factors plus GTP
c. polymerases plus GTP
d. SRP plus chaperones
e. signal peptides plus release factor

____ 107. When the ribosome reaches a stop codon on the mRNA, no corresponding tRNA enters the A site. If the translation reaction were to be experimentally stopped at this point, which of the following would you be able to isolate?
a. an assembled ribosome with a polypeptide attached to the tRNA in the P site
b. separated ribosomal subunits, a polypeptide, and free tRNA
c. an assembled ribosome with a separated polypeptide
d. separated ribosomal subunits with a polypeptide attached to the tRNA
e. a cell with fewer ribosomes

____ 108. In the 1920s Muller discovered that X-rays caused mutation in *Drosophila.* In a related series of experiments, in the 1940s, Charlotte Auerbach discovered that chemicals—she used nitrogen mustards—have a similar effect. A new chemical food additive is developed by a cereal manufacturer. Why do we test for its ability to induce mutation?

a. We worry that it might cause mutation in cereal grain plants.
b. We want to make sure that it does not emit radiation.
c. We want to be sure that it increases the rate of mutation sufficiently.
d. We want to prevent any increase in mutation frequency.
e. We worry about its ability to cause infection.

____ 109. What is the effect of a nonsense mutation in a gene?
a. It changes an amino acid in the encoded protein.
b. It has no effect on the amino acid sequence of the encoded protein.
c. It introduces a premature stop codon into the mRNA.
d. It alters the reading frame of the mRNA.
e. It prevents introns from being excised.

____ 110. Sickle-cell disease is probably the result of which kind of mutation?
a. point
b. frameshift
c. nonsense
d. nondisjunction
e. both B and D

____ 111. A frameshift mutation could result from
a. a base insertion only.
b. a base deletion only.
c. a base substitution only.
d. deletion of three consecutive bases.
e. either an insertion or a deletion of a base.

____ 112. Which of the following DNA mutations is the most likely to be damaging to the protein it specifies?
a. a base-pair deletion
b. a codon substitution
c. a substitution in the last base of a codon
d. a codon deletion
e. a point mutation

____ 113. Which of the following statements are true about protein synthesis in prokaryotes?
a. Extensive RNA processing is required before prokaryotic transcripts can be translated.
b. Translation can begin while transcription is still in progress.
c. Prokaryotic cells have complicated mechanisms for targeting proteins to the appropriate cellular organelles.
d. Translation requires antibiotic activity.
e. Unlike eukaryotes, prokaryotes require no initiation or elongation factors.

____ 114. Gene expression in Archaea differs from that in other prokaryotes. It shares features with which of the following?
a. eubacteria only
b. eukaryotes only
c. protists only

d. fungi only
e. bacteria and eukaryotes

____ 115. Of the following, which is the most current description of a gene?
a. a unit of heredity that causes formation of a phenotypic characteristic
b. a DNA subunit that codes for a single complete protein
c. a DNA sequence that is expressed to form a functional product: either RNA or polypeptide
d. a DNA—RNA sequence combination that results in an enzymatic product
e. a discrete unit of hereditary information that consists of a sequence of amino acids

____ 116. In eukaryotic cells, transcription cannot begin until
a. the two DNA strands have completely separated and exposed the promoter.
b. several transcription factors have bound to the promoter.
c. the 5' caps are removed from the mRNA.
d. the DNA introns are removed from the template.
e. DNA nucleases have isolated the transcription unit.

____ 117. Which of the following is *not* true of a codon?
a. It consists of three nucleotides.
b. It may code for the same amino acid as another codon.
c. It never codes for more than one amino acid.
d. It extends from one end of a tRNA molecule.
e. It is the basic unit of the genetic code.

____ 118. The anticodon of a particular tRNA molecule is
a. complementary to the corresponding mRNA codon.
b. complementary to the corresponding triplet in rRNA.
c. the part of tRNA that bonds to a specific amino acid.
d. changeable, depending on the amino acid that attaches to the tRNA.
e. catalytic, making the tRNA a ribozyme.

____ 119. Which of the following is *not* true of RNA processing?
a. Exons are cut out before mRNA leaves the nucleus.
b. Nucleotides may be added at both ends of the RNA.
c. Ribozymes may function in RNA splicing.
d. RNA splicing can be catalyzed by spliceosomes.
e. A primary transcript is often much longer than the final RNA molecule that leaves the nucleus.

The following questions refer to Figure 17.5, a table of codons.

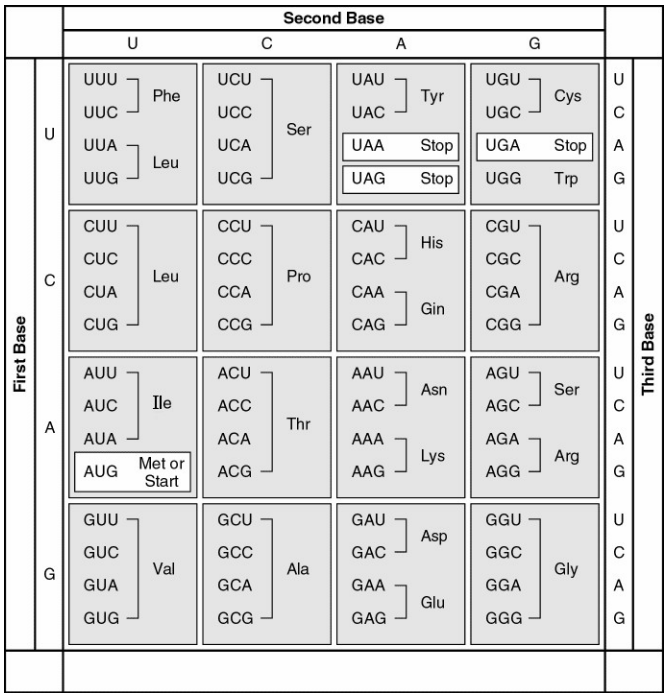


Figure 17.5

____ 120. Using Figure 17.5, identify a 5' → 3' sequence of nucleotides in the DNA template strand for an mRNA coding for the polypeptide sequence Phe-Pro-Lys.

a. 5'-UUUGGGAAA-3'
b. 5'-GAACCCCTT-3'
c. 5'-AAAACCTTT-3'
d. 5'-CTTCGGGAA-3'
e. 5'-AAACCCUUU-3'

____ 121. Which of the following mutations would be *most* likely to have a harmful effect on an organism?

a. a base-pair substitution
b. a deletion of three nucleotides near the middle of a gene
c. a single nucleotide deletion in the middle of an intron
d. a single nucleotide deletion near the end of the coding sequence
e. a single nucleotide insertion downstream of, and close to, the start of the coding sequence

____ 122. Which component is *not* directly involved in translation?

a. mRNA
b. DNA
c. tRNA
d. ribosomes
e. GTP

Short Answer

Use Figure 16.1 to answer the following questions.

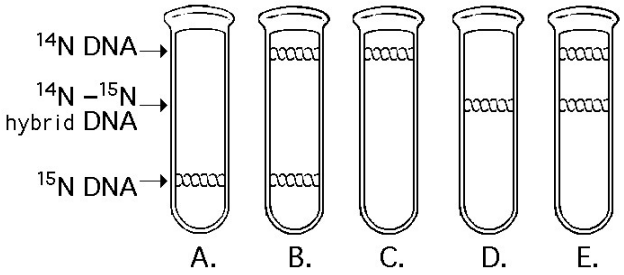


Figure 16.1

123. In the late 1950s, Meselson and Stahl grew bacteria in a medium containing "heavy" nitrogen (^{15}N) and then transferred them to a medium containing ^{14}N. Which of the results in Figure 16.1 would be expected after one round of DNA replication in the presence of ^{14}N?

124. A space probe returns with a culture of a microorganism found on a distant planet. Analysis shows that it is a carbon-based life-form that has DNA. You grow the cells in ^{15}N medium for several generations and then transfer them to ^{14}N medium. Which pattern in Figure 16.1 would you expect if the DNA was replicated in a conservative manner?

125. Review the roles of RNA by filling in the following table:

Type of RNA	Functions
Messenger RNA (mRNA)	
Transfer RNA (tRNA)	
	Plays catalytic (ribozyme) roles and structural roles in ribosomes
Primary transcript	
Small nuclear RNA (snRNA)	

AP DNA PrSyn Practice Test 2016
Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 1
2. ANS: C PTS: 1
3. ANS: C PTS: 1
4. ANS: B PTS: 1
5. ANS: A PTS: 1 TOP: Concept 16.1
   SKL: Knowledge/Comprehension
6. ANS: B PTS: 1 TOP: Concept 16.1
   SKL: Knowledge/Comprehension
7. ANS: E PTS: 1 TOP: Concept 16.1
   SKL: Knowledge/Comprehension
8. ANS: B PTS: 1 TOP: Concept 16.1
   SKL: Knowledge/Comprehension
9. ANS: E PTS: 1 TOP: Concept 16.1
   SKL: Application/Analysis
10. ANS: B PTS: 1 TOP: Concept 16.1
    SKL: Application/Analysis
11. ANS: C PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
12. ANS: A PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
13. ANS: A PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
14. ANS: A PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
15. ANS: A PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
16. ANS: A PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
17. ANS: B PTS: 1 TOP: Concept 16.2
    SKL: Knowledge/Comprehension
18. ANS: B PTS: 1 TOP: Concept 16.2
    SKL: Knowledge/Comprehension
19. ANS: E PTS: 1 TOP: Concept 16.2
    SKL: Application/Analysis
20. ANS: D PTS: 1 TOP: Concept 16.1
    SKL: Knowledge/Comprehension
21. ANS: C PTS: 1 TOP: Concept 16.2
    SKL: Knowledge/Comprehension
22. ANS: B PTS: 1 TOP: Concept 16.2
    SKL: Application/Analysis
23. ANS: C PTS: 1 TOP: Concept 16.2
    SKL: Knowledge/Comprehension
24. ANS: C PTS: 1 TOP: Concept 16.2

SKL: Knowledge/Comprehension
25. ANS: C PTS: 1 TOP: Concept 16.2
SKL: Synthesis/Evaluation
26. ANS: D PTS: 1 TOP: Concept 16.2
SKL: Application/Analysis
27. ANS: E PTS: 1 TOP: Concept 16.2
SKL: Synthesis/Evaluation
28. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Synthesis/Evaluation
29. ANS: B PTS: 1 TOP: Concept 16.2
SKL: Application/Analysis
30. ANS: E PTS: 1 TOP: Concept 16.2
SKL: Application/Analysis
31. ANS: C PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
32. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Application/Analysis
33. ANS: D PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
34. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
35. ANS: C PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
36. ANS: E PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
37. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
38. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
39. ANS: B PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
40. ANS: E PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
41. ANS: A PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
42. ANS: C PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
43. ANS: D PTS: 1 TOP: Concept 16.2
SKL: Knowledge/Comprehension
44. ANS: D PTS: 1 TOP: Concept 16.2
SKL: Application/Analysis
45. ANS: A PTS: 1 TOP: Concepts 16.2-16.3
SKL: Application/Analysis
46. ANS: B PTS: 1 TOP: Concept 16.3
SKL: Knowledge/Comprehension
47. ANS: C PTS: 1 TOP: Self-Quiz Questions
48. ANS: D PTS: 1 TOP: Self-Quiz Questions
49. ANS: B PTS: 1 TOP: Self-Quiz Questions

50. ANS: C PTS: 1 TOP: Self-Quiz Questions
51. ANS: D PTS: 1 TOP: Self-Quiz Questions
52. ANS: A PTS: 1 TOP: Self-Quiz Questions
53. ANS: C PTS: 1 TOP: Self-Quiz Questions
54. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
55. ANS: A PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
56. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
57. ANS: D PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
58. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Knowledge/Comprehension
59. ANS: B PTS: 1 TOP: Concept 17.1
SKL: Knowledge/Comprehension
60. ANS: B PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
61. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
62. ANS: A PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
63. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
64. ANS: E PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
65. ANS: C PTS: 1 TOP: Concept 17.1
SKL: Synthesis/Evaluation
66. ANS: A PTS: 1 TOP: Concept 17.1
SKL: Synthesis/Evaluation
67. ANS: D PTS: 1 TOP: Concept 17.1
SKL: Application/Analysis
68. ANS: C PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
69. ANS: D PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
70. ANS: B PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
71. ANS: A PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
72. ANS: B PTS: 1 TOP: Concept 17.2
SKL: Synthesis/Evaluation
73. ANS: B PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
74. ANS: C PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension
75. ANS: D PTS: 1 TOP: Concept 17.2
SKL: Knowledge/Comprehension

76. ANS: C PTS: 1 TOP: Concept 17.2
SKL: Synthesis/Evaluation
77. ANS: A PTS: 1 TOP: Concept 17.2
SKL: Synthesis/Evaluation
78. ANS: B PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
79. ANS: D PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
80. ANS: A PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
81. ANS: B PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
82. ANS: C PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
83. ANS: C PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
84. ANS: C PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
85. ANS: B PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
86. ANS: D PTS: 1 TOP: Concept 17.3
SKL: Synthesis/Evaluation
87. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Application/Analysis
88. ANS: E PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
89. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
90. ANS: D PTS: 1 TOP: Concept 17.4
SKL: Application/Analysis
91. ANS: B PTS: 1 TOP: Concept 17.3
SKL: Knowledge/Comprehension
92. ANS: B PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
93. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
94. ANS: E PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
95. ANS: B PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
96. ANS: A PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
97. ANS: A PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
98. ANS: D PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
99. ANS: B PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension
100. ANS: B PTS: 1 TOP: Concept 17.4

SKL: Knowledge/Comprehension

101. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension

102. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Synthesis/Evaluation

103. ANS: E PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension

104. ANS: C PTS: 1 TOP: Concept 17.4
SKL: Application/Analysis

105. ANS: D PTS: 1 TOP: Concept 17.4
SKL: Application/Analysis

106. ANS: B PTS: 1 TOP: Concept 17.4
SKL: Knowledge/Comprehension

107. ANS: A PTS: 1 TOP: Concept 17.4
SKL: Synthesis/Evaluation

108. ANS: D PTS: 1 TOP: Concept 17.5
SKL: Synthesis/Evaluation

109. ANS: C PTS: 1 TOP: Concept 17.5
SKL: Knowledge/Comprehension

110. ANS: A PTS: 1 TOP: Concept 17.5
SKL: Application/Analysis

111. ANS: E PTS: 1 TOP: Concept 17.5
SKL: Knowledge/Comprehension

112. ANS: A PTS: 1 TOP: Concept 17.5
SKL: Knowledge/Comprehension

113. ANS: B PTS: 1 TOP: Concept 17.6
SKL: Knowledge/Comprehension

114. ANS: E PTS: 1 TOP: Concept 17.6
SKL: Knowledge/Comprehension

115. ANS: C PTS: 1 TOP: Concept 17.6
SKL: Knowledge/Comprehension

116. ANS: B PTS: 1 TOP: Self-Quiz Questions

117. ANS: D PTS: 1 TOP: Self-Quiz Questions

118. ANS: A PTS: 1 TOP: Self-Quiz Questions

119. ANS: A PTS: 1 TOP: Self-Quiz Questions

120. ANS: D PTS: 1 TOP: Self-Quiz Questions

121. ANS: E PTS: 1 TOP: Self-Quiz Questions

122. ANS: B PTS: 1 TOP: Self-Quiz Questions

SHORT ANSWER

123. ANS:
D

PTS: 1 TOP: Concept 16.2 SKL: Application/Analysis

124. ANS:
B

PTS: 1 TOP: Concept 16.2 SKL: Application/Analysis

125. ANS:

Type of RNA	Functions
Messenger RNA (mRNA)	Carries information specifying amino acid sequences of proteins from DNA to ribosomes.
Transfer RNA (tRNA)	Serves as adapter molecule in protein synthesis; translates mRNA codons into amino acids.
Ribosomal RNA (rRNA)	Plays catalytic (ribozyme) roles and structural roles in ribosomes.
Primary transcript	Is a precursor to mRNA, rRNA, or tRNA, before being processed. Some intron RNA acts as a ribozyme, catalyzing its own splicing.
Small nuclear RNA (snRNA)	Plays structural and catalytic roles in spliceosomes, the complexes of protein and RNA that splice pre-mRNA.

PTS: 1 TOP: Self-Quiz Questions