

**Biology Standard 2 (All elements)**

Name: \_\_\_\_\_

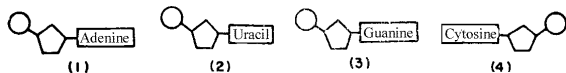
Date: \_\_\_\_\_

1. A strand of DNA consists of thousands of smaller, repeating units known as
  - A. lipids
  - B. amino acids
  - C. nucleotides
  - D. polysaccharides
  
2. In molecules of DNA, which nitrogenous base bonds with adenine
  - A. adenine
  - B. uracil
  - C. guanine
  - D. thymine
  
3. Which nitrogenous base is normally present in DNA but absent from RNA?
  - A. adenine
  - B. cytosine
  - C. thymine
  - D. guanine
  
4. Which two bases are present in equal amounts in a double-stranded DNA molecule?
  - A. cytosine and thymine
  - B. adenine and thymine
  - C. adenine and uracil
  - D. cytosine and uracil
  
5. All nucleotides of DNA and RNA contain a
  - A. uracil base
  - B. thymine base
  - C. ribose sugar
  - D. phosphate group
  
6. The DNA code for a particular amino acid contains a sequence of how many nucleotides?
  - A. 5
  - B. 6
  - C. 3
  - D. 4
  
7. The genetic material in living organisms is composed of organic molecules known as
  - A. starches
  - B. lipids
  - C. nucleic acids
  - D. fatty acids

8. In a DNA molecule, the number of guanine nucleotides will most likely equal the number of
- adenine nucleotides
  - thymine nucleotides
  - cytosine nucleotides
  - ribose nucleotides

9. Based on structure, in what way do DNA molecules differ from RNA molecules?
- RNA contains the base uracil; DNA does not contain uracil.
  - DNA is composed of two chains of nucleotides; RNA is composed of three chains of nucleotides.
  - RNA is helical; DNA is branched.
  - DNA is composed of four different bases; RNA is composed of three different bases.

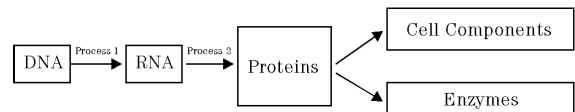
10. Which structure pairs with the adenine nucleotide during the formation of messenger RNA?



- 1
- 2
- 3
- 4

11. Knowledge of the structure of DNA is important in the study of life because DNA
- stores food
  - transmits genetic information
  - transmits chemical energy
  - stores enzymes

12. Within which organelle does process 1 occur?



- ribosome
- nucleus
- centriole
- lysosome

13. Messenger RNA molecules are formed as a result of

- process 1, only
- process 2, only
- both process 1 and process 2
- neither process 1 nor process 2

14. Within a living cell, which organelles are necessary for process 2 to occur?

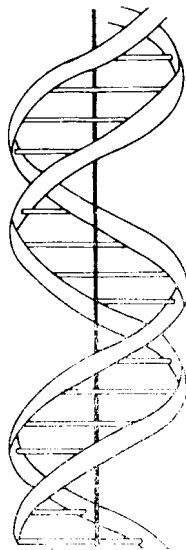
- A. centrioles
- B. lysosomes
- C. Golgi bodies
- D. ribosomes

15. The presence of DNA is important for cellular metabolic activities because DNA

- A. directs the production of enzymes
- B. is a structural component of cell walls
- C. directly increase the solubility of nutrients
- D. is the major component of cytoplasm

16. The diagram represents a molecule of

- A. DNA
- B. RNA
- C. ATP
- D. FSH



17. Which two scientists proposed the double helix arrangement of this molecule

- A. Hardy and Weinberg
- B. Darwin and Lamarck
- C. Watson and Crick
- D. Mendel and De Vries

18. Which statement describes the substance represented in the diagram?

- A. It is a polymer found in chromosomes.
- B. It is a small molecule found in ribosomes.
- C. It is an energy-releasing molecule located in the cytoplasm.
- D. It is a double lipid layer molecule with connecting proteins.

19. Which is a structural component of a DNA nucleotide?

- A. glucose
- B. an enzyme
- C. deoxyribose
- D. an amino acid

20. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

May contain the four bases adenine, cytosine, guanine, and thymine

- A. DNA molecules, only
- B. RNA molecules, only
- C. Both DNA and RNA molecules
- D. Neither DNA nor RNA molecules

21. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Present in the nucleus of a cell

- A. DNA molecules, only
- B. RNA molecules, only
- C. Both DNA and RNA molecules
- D. Neither DNA nor RNA molecules

22. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Carry genetic information from the nucleus to the ribosomes

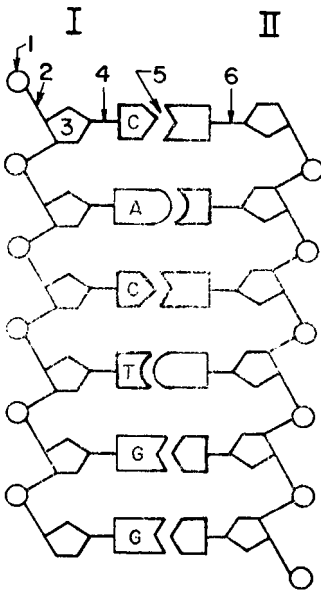
- A. DNA molecules, only
- B. RNA molecules, only
- C. Both DNA and RNA molecules
- D. Neither DNA nor RNA molecules

23. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Consist of chains of nucleotides

- A. DNA molecules, only
- B. RNA molecules, only
- C. Both DNA and RNA molecules
- D. Neither DNA nor RNA molecules

24. The model of DNA represented in the diagram was developed by



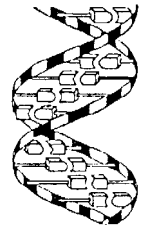
- A. Hardy and Weinberg  
 B. Miller and Fox  
 C. Watson and Crick  
 D. Weismann and Lamarck

25. The group of atoms represented by the symbol labeled I is also present in molecules of

- A. glucose                      B. uracil  
 C. H<sub>2</sub>O                          D. ATP

26. Which scientists developed the molecular model represented?

- A. Mendel and Darwin  
 B. Watson and Crick  
 C. Lamarck and Weismann  
 D. Miller and Fox



27. Within a cell, DNA is chiefly found in the

- A. cell wall                      B. plasma membrane  
 C. ribosomes                    D. chromosomes

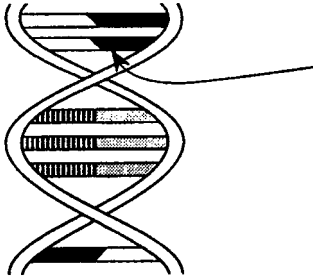
28. Which molecule has the shape of a double-stranded helix?

- A. RNA    B. DNA    C. ADP    D. ATP

29. The individuality of an organism is determined by the

- A. sequence of nitrogenous bases in deoxyribonucleic acid  
 B. number of amino acids in a cell  
 C. position of the ribosomes on the endoplasmic reticulum  
 D. number of nitrogenous bases in a codon

30. The diagram shown represents Watson and Crick's model of DNA.



The substance indicated by the arrow could be

- A. thymine                      B. deoxyribose  
C. ribose                         D. uracil

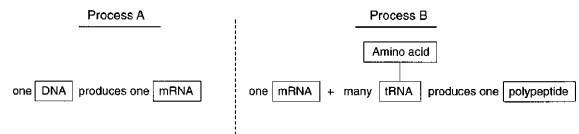
31. A DNA nucleotide is composed of

- A. carbon, hydrogen, oxygen, nitrogen, and phosphorus  
B. carbon, hydrogen, nitrogen, sulfur, and calcium  
C. calcium, hydrogen, oxygen, phosphorus, and iron  
D. oxygen, hydrogen, phosphorus, sulfur, and iron

32. A change in genetic material that produces a variation in a species may be a result of

- A. a mutation  
B. competition  
C. overproduction of a species  
D. a struggle for survival

33. Base your answer(s) to the following question(s) on the diagram below of two processes in the synthesis of proteins and on your knowledge of biology.



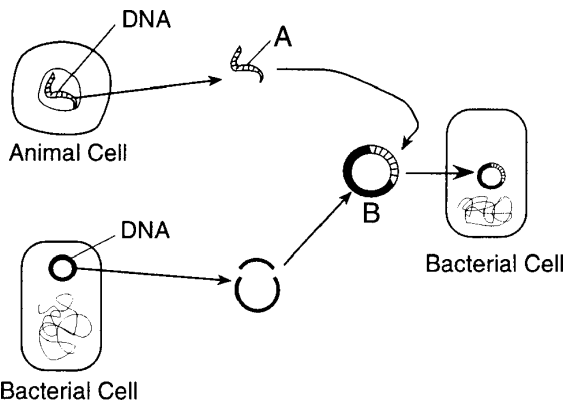
Process B involves the pairing of a codon with a triplet code on a transfer RNA molecule. A correct pairing would

- A. CAT and GTA              B. AAU and UUA  
C. GUG and UGU             D. CAG and GUA

34. Process A occurs within the

- A. mitochondrion              B. ribosome  
C. chloroplast                 D. nucleus

35. Base your answer(s) to the following question(s) on the diagram below and on your knowledge of biology.



Structure *A* contains a

- A. genetic code
- B. single nucleotide, only
- C. messenger RNA molecule
- D. small polysaccharide

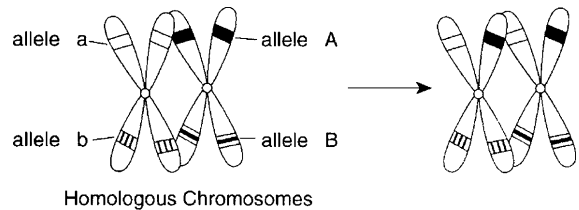
36. Structure *B* represents

- A. a ribosome
- B. transfer RNA
- C. recombinant DNA
- D. a male gamete

37. Which mutation could be passed on to future generations?

- A. a gene change in a liver cell
- B. cancer caused by excessive exposure of skin cells to the Sun
- C. a chromosomal alteration during gametogenesis
- D. random breakage of a chromatid in a leaf cell of a maple tree

38. The results of a genetic process are represented in the diagram.



Which process most likely produced these results?

- A. chromosomal mutation during mitosis
- B. nondisjunction during meiosis
- C. independent assortment during mitosis
- D. crossing-over during meiosis

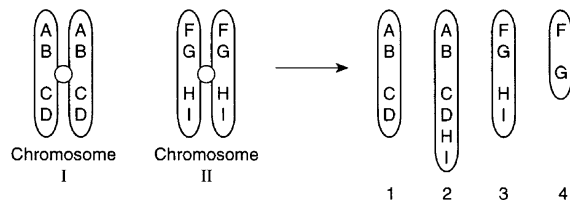
39. If a portion of a messenger RNA molecule contains the base sequence A–A–U, the corresponding transfer RNA base sequence is

- A. A–A–U
- B. G–G–T
- C. T–T–C
- D. U–U–A

40. The greatest degree of genetic variation would be found in offspring that result from

- A. binary fission
- B. fertilization
- C. regeneration
- D. grafting

41. The accompanying diagram shows some chromosomal alterations



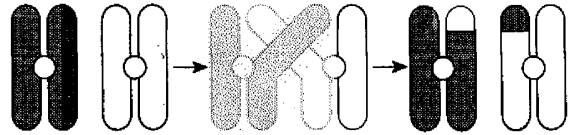
Which chromosome represents an alteration known as a deletion?

- A. 1
- B. 2
- C. 3
- D. 4

42. A normal body cell of a fruit cell contains eight chromosomes. Each normal gamete of this organism contains only four chromosomes, as a result of the process of

- A. binary fission
- B. vegetative propagation
- C. germination
- D. meiosis

43. Which process is illustrated by the diagram shown?



- A. crossing-over
- B. nondisjunction
- C. sex determination
- D. independent assortment

44. A molecule of DNA is a polymer composed of

- A. glucose
- B. amino acids
- C. fatty acids
- D. nucleotides

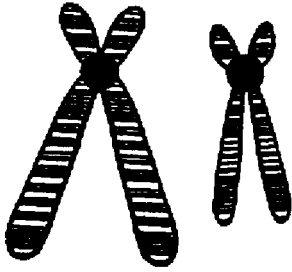
45. The exchange of segments of chromatids during synapsis is known as

- A. gene linkage
- B. sex linkage
- C. crossing-over
- D. nondisjunction

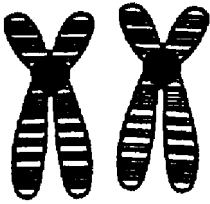


46. Which diagram represents a pair of homologous chromosomes?

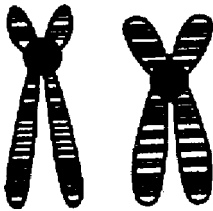
A.



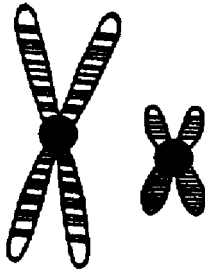
B.



C.



D.



47. What is a definition of the term “gene”?

- A. three messenger-RNA nucleotides coded for a specific amino acid
- B. the number of nitrogenous bases in a nucleotide
- C. a transfer-RNA nucleotide sequence specific for a particular amino acid
- D. a sequence of nucleotides that directs the synthesis of a product, such as a protein

48. Deoxyribonucleic acid molecules serve as a template for the synthesis of molecules of

- A. amino acids
- B. carbohydrates
- C. messenger RNA
- D. lipids

49. The kind of genes an organisms possesses is dependent upon the

- A. type of proteins in the organism’s nuclei
- B. sequence of nucleotides in the organism’s DNA
- C. number of ribosomes in the organism’s cytoplasm
- D. size of the mitochondrial in the organism’s cells

50. Which process is illustrated in the diagram?

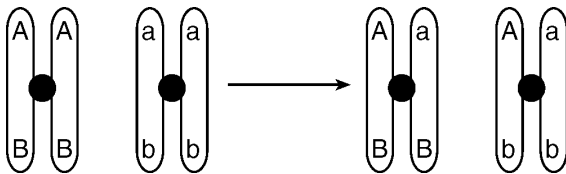


- A. segregation
- B. replication
- C. crossing-over
- D. nondisjunction

51. One similarity between DNA and messenger RNA molecules is that they both contain

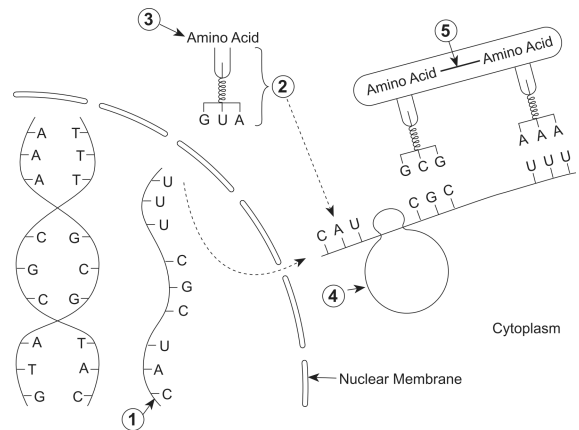
- A. the same sugar
- B. genetic codes based on sequences of bases
- C. a nitrogenous base known as uracil
- D. double-stranded polymers

52. The diagram below represents a change in composition of homologous chromosomes during synapsis. This change is most likely the result of the process of



- A. nondisjunction
- B. gene linkage
- C. crossing-over
- D. polyploidy

53. Base your answer(s) to the following question(s) on the diagram below, which represents some biochemical reactions involved in a cellular process, and on your knowledge of biology.



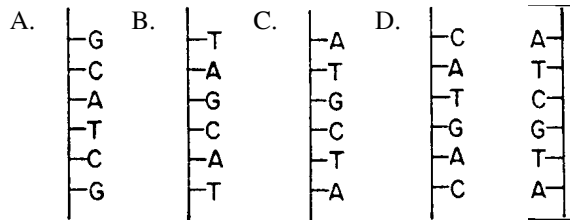
What is an example of a molecule produced by this type of process?

- A. glucose
- B. glycogen
- C. a fatty acid
- D. a protein

54. A mutation may occur in a gene as a result of the

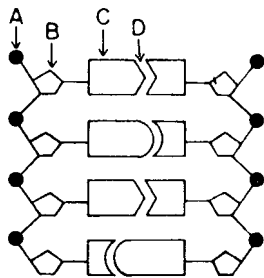
- A. synthesis of a spindle apparatus
- B. loss of a nucleotide
- C. loss of a nucleolus
- D. replication of centromeres

55. Which DNA strand represents the complementary base sequence to the portion of a DNA strand represented in the diagram shown?



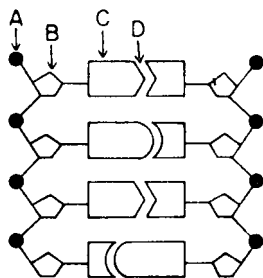
56. The greatest number of different kinds of nitrogenous bases that could be represented in this section of DNA is

- A. 1      B. 2  
C. 3      D. 4



57. The parts on the diagram that together represent a nucleotide are

- A. A, B, and C  
B. B, C, and D  
C. A, C, and D  
D. A, B, and D



58. Transfer RNA molecules pick up amino acids which are free in the cytoplasm and carry them to

- A. lysosomes                      B. chromosomes  
C. nuclei                          D. ribosomes

59. A DNA molecule with the base sequence A-G-C-T-C-A was used as a template for the synthesis of a messenger RNA molecule. Which base sequence correctly represents the corresponding portion of this RNA molecule?

- A. T-C-A-G-C-A                  B. U-C-G-A-G-U  
C. A-G-C-U-C-A                  D. A-T-G-A-C-T

60. If one strand of DNA molecule has the base sequence A-G-C-T-A, the complementary strand of DNA would have the base sequence

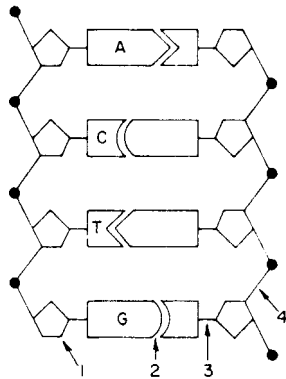
- A. A-G-C-T-A                      B. U-C-G-A-T  
C. U-C-G-A-U                      D. T-C-G-A-T

61. The sequence of bases in one strand of a DNA molecule is arranged in the order adenine–guanine–thymine–cytosine. The sequence of bases in the complementary strand is

- A. adenine–cytosine–thymine–guanine
- B. guanine–adenine–cytosine–uracil
- C. thymine–cytosine–adenine–guanine
- D. cytosine–thymine–guanine–adenine

62. According to the diagram, how many nucleotides were bonded to make this segment of DNA?

- A. 8      B. 6
- C. 3      D. 4

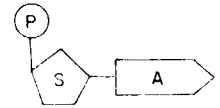


63. The sequence of nitrogen bases on the complementary chain in the diagram is

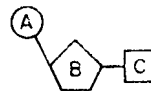
- A. T-A-G-C                      B. U-G-A-C
- C. T-G-A-C                      D. U-A-G-C

64. The molecule represented by the lettered symbols shown is a

- A. nucleotide
- B. codon
- C. triplet code
- D. base pair

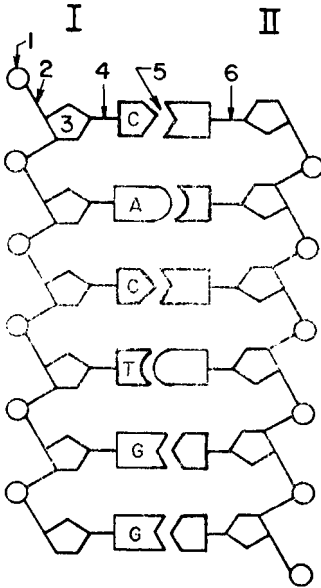


65. Which is the correct identification of the parts of the DNA nucleotide in the diagram shown?



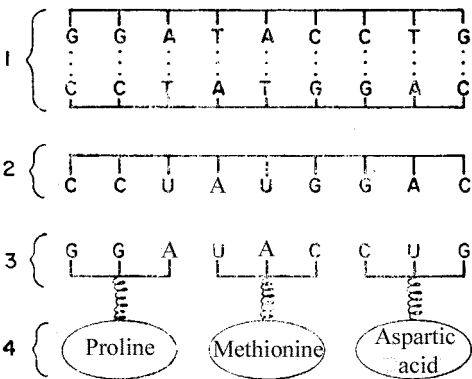
- A. A=uracil, B=deoxyribose, C=thymine
- B. A=phosphate, B=ribose, C=uracil
- C. A=thymine, B=ribose, C=uracil
- D. A=phosphate, B=deoxyribose, C=thymine

66. The base sequence of strand II is most likely



- A. C-A-C-T-G-G      B. G-G-T-C-A-C  
 C. G-T-G-A-C-C      D. G-T-G-U-C-C

67. The messenger RNA codon for methionine is



- A. TAC    B. UAC    C. ATG    D. AUG

68. A change in the sequence of bases in a DNA molecule is known as

- A. bacterial transformation  
 B. a chromosomal replication  
 C. a gene mutation  
 D. protein synthesis

69. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Combines directly with amino acids

- A. DNA, only  
 B. Messenger RNA, only  
 C. Transfer RNA, only  
 D. DNA, messenger RNA, and transfer RNA

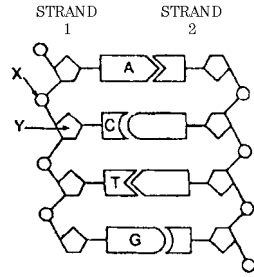
70. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Contains thymine

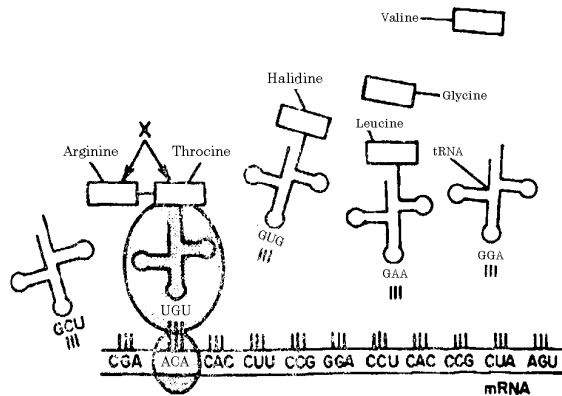
- A. DNA, only  
 B. Messenger RNA, only  
 C. Transfer RNA, only  
 D. DNA, messenger RNA, and transfer RNA

71. Structure Y represents

- A. a fat
- B. a sugar
- C. water
- D. protein



72. The process represented in the diagram occurs on the cell organelle known as a

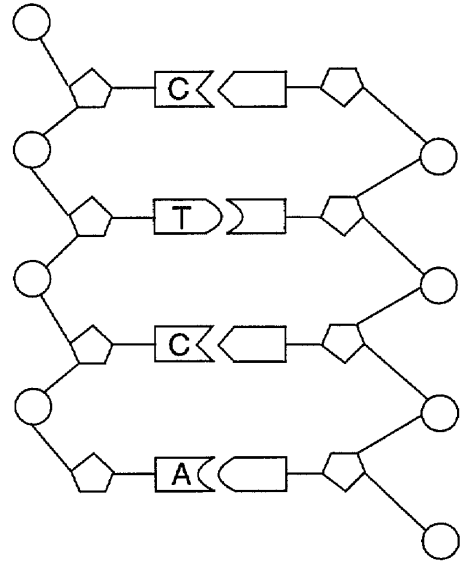


- A. vacuole
- B. ribosome
- C. chloroplast
- D. mitochondrion

73. The process represented in the diagram is

- A. lipid digestion
- B. cell respiration
- C. protein synthesis
- D. protein hydrolysis

74. The diagram shows a portion of a DNA molecule. The base sequence of the unlabeled strand shown in the diagram is most likely



- A. G-A-G-T
- B. C-U-C-A
- C. T-C-T-G
- D. G-A-G-U

75. In nucleotides, the letter A, G, C, and T represents

- A. phosphate groups
- B. deoxyribose sugars
- C. nitrogenous bases
- D. ribose sugars

76. What is the complementary messenger-RNA sequence for the DNA sequence shown?

C A A G G T  
 └─┘ └─┘ └─┘ └─┘ └─┘

- A. C-A-A-G-G-U      B. G-T-T-C-C-A  
 C. G-U-U-C-C-A      D. C-A-A-G-G-T

77. *Messenger RNA (mRNA) Codes for Selected Amino Acids*

Amino Acid	mRNA Code
Leucine	C-C-A
Arginine	C-G-A
Phenylalanine	U-U-U
Valine	G-U-U
Lysine	A-A-A

Which amino acid will be carried to a ribosome by a transfer RNA molecule containing the triplet code A-A-A?

- A. valine                      B. lysine  
 C. leucine                     D. phenylalanine

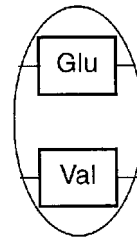
78. Which base sequence of a DNA molecule produces a codon on an mRNA molecule that will allow the amino acid arginine to be incorporated into a protein?

- A. C-G-A                      B. G-C-T  
 C. C-G-U                     D. G-C-U

79. The code of a gene is delivered to the enzyme-producing region of a cell by a

- A. hormone  
 B. nerve impulse  
 C. messenger RNA molecule  
 D. DNA molecule

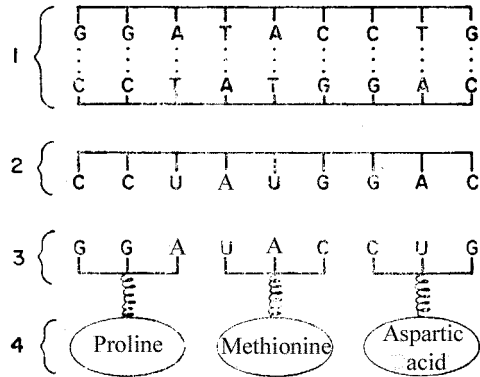
80. The difference in amino acids indicated in the circle portion of the diagram shown causes a change in the shape of red blood cells. What is the probable cause of this difference in the hemoglobin molecules?



Amino Acids
Glu = glutamic acid
His = histadine
Leu = leucine
Lys = lysine
Pro = proline
Thr = threonine
Val = valine

- A. the inability to synthesize a specific enzyme, causing an accumulation of fat  
 B. the substitution of one kind of nucleotide for another in a DNA molecule  
 C. an abnormal metabolism of phenylalanine  
 D. a recessive allele located on an X-chromosome

81. The DNA code for aspartic acid is



- A. C-T-G                      B. C-C-U  
C. C-C-T                      D. C-U-G

82. This may contain adenine, cytosine, guanine, and thymine.

- A. DNA molecules, only  
B. RNA molecules, only  
C. Both DNA and RNA molecules  
D. Neither DNA nor RNA molecules

83. Which statement best describes messenger RNA?

- A. It transfers polypeptides to the nucleus.  
B. It is chemically more complex than DNA.  
C. It has one oxygen atom less than DNA.  
D. It is composed of a single strand of nucleotides.

84. Today some plants are cloned to produce millions of offspring from a small piece of the original plant. Plant cloning is possible because the plant's diploid cells have the same genetic potential as the zygote that originally produced the plant and because of the action of the plant hormones auxin and cytokinin. These hormones are combined with other organic and inorganic substances in a growth medium that stimulates the production of new plants. The cloning process occurs in a sterile environment. The new plants produced are genetically identical to the original plant and to each other.

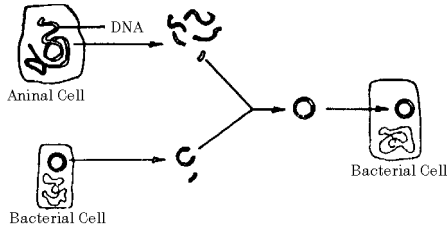
The process and equipment for cloning are more expensive than for other forms of vegetative propagation. The advantage of cloning is that large numbers of desirable plants are produced in a short period of time. For example, a million plants of a new variety can be cloned in about six months.

For which reason is cloning used to reproduce plants?

- A. Plants with a large degree of genetic variability are produced.  
B. Plants are produced more cheaply than by other vegetative methods.  
C. Plants are produced by the sexual process, resulting in seeds.  
D. A large number of plants are produced in a short period of time.



85. The technique shown in the diagram represents



- A. amniocentesis
- B. the formation of a karyotype
- C. animal cloning
- D. the formation of recombinant DNA

86. The process is useful in producing

- A. insulin and human growth hormone
- B. artificial hearts and kidneys
- C. organ transplants
- D. identical frogs

87. In recombinant DNA technology, a piece of DNA from one organism is joined to the DNA of another organism. What may result from further work with this altered DNA?

- A. Cytoplasmic organelles may be transferred from one cell to another.
- B. The structure of a nucleotide may be changed.
- C. Messenger RNA molecules may not be necessary for protein synthesis.
- D. New genes may be introduced into an organism.

88. An example of cloning is the

- A. implantation of cow embryos in a rabbit uterus
- B. production of new plants from the leaf cells of a single plant
- C. development of unfertilized frog eggs
- D. preparation of an enlarged photograph showing paired homologous chromosomes from a cell

89. Select the technique, *chosen from the list below*, that is best described by the statement shown.

This technique involves the transfer of genetic information from a human to a bacterial cell such as *E. coli*, thus causing the bacterial cell to produce human growth hormone.

- A. Amniocentesis
- B. Cloning
- C. Genetic engineering
- D. Karyotyping

90. Which laboratory procedure has made possible the development of bacteria that can synthesize human insulin?

- A. karyotyping
- B. genetic engineering
- C. amniocentesis
- D. screening of body fluids

91. Frequent injections of insulin are often required in order to treat the disorder known as diabetes. Insulin can now be produced in the laboratory through the use of

- A. vegetative propagation
- B. artificial selection
- C. sexual reproduction
- D. recombinant DNA

92. In genetic engineering, the transfer of hereditary information from one species to another results in the formation of

- A. motile gametes
- B. recombinant DNA
- C. dihybrids
- D. zygotes

93. Select the term, *chosen from the list below*, that is best described by the statement shown.

A portion of a chromosome is lost.

- A. Amniocentesis
- B. Cloning
- C. Deletion
- D. Translocation

94. Select the term, *chosen from the list below*, that is best described by the statement shown.

Many identical seedlings are grown from cells that were removed from a single tree seedling.

- A. Amniocentesis
- B. Karyotyping
- C. Cloning
- D. Translocation

95. In 1973, Stanley Cohern and Herbert Boyer inserted a gene from an African clawed frog into a bacterium. The bacterium then began producing a protein directed by the code found on the inserted frog gene.

The procedure used by Cohern and Boyer is known as

- A. cloning
- B. genetic engineering
- C. karyotyping
- D. genetic screening

96. Additional copies of the bacterium containing the frog gene could be produced by

- A. asexual reproduction
- B. cross-pollination
- C. inbreeding
- D. grafting

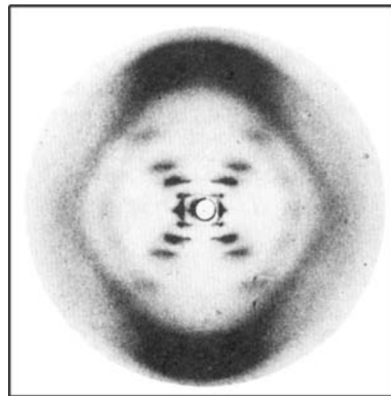
97. Which process is most similar to the process of cloning?

- A. fertilization
- B. vegetative propagation
- C. meiosis
- D. gamete formation

98. Using special enzymes, scientists have successfully removed the gene that controls the production of interferon and have inserted this gene into the DNA of certain bacteria. These bacteria can now produce interferon. This technique is known as

- A. amniocentesis
- B. differentiation
- C. genetic engineering
- D. karyotyping

99. The diagram below shows Rosalind Franklin's x-ray diffraction image of DNA.



How did this evidence affect the work of Watson and Crick?

- A. It was used to determine the physical structure of DNA.
- B. It was used to identify the four bases that make up DNA.
- C. It was used to develop the theory of independent assortment.
- D. It was used to show that DNA was the molecule of inheritance.

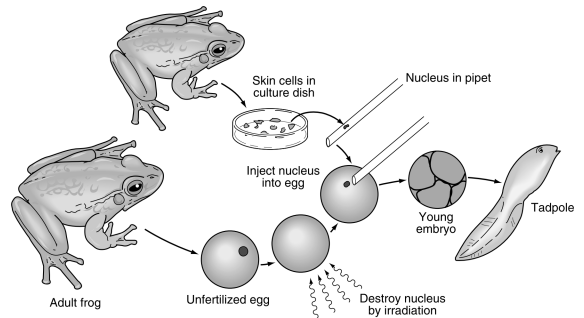
100. **Codons Found in Messenger RNA**

		Second Base				
		U	C	A	G	
First Base	U	Phe	Ser	Tyr	Cys	U
		Phe	Ser	Tyr	Cys	C
		Leu	Ser	Stop	Stop	A
		Leu	Ser	Stop	Trp	G
C	Leu	Pro	His	Arg	U	
	Leu	Pro	His	Arg	C	
	Leu	Pro	Gln	Arg	A	
	Leu	Pro	Gln	Arg	G	
A	Ile	Thr	Asn	Ser	U	
	Ile	Thr	Asn	Ser	C	
	Ile	Thr	Lys	Arg	A	
	Met	Thr	Lys	Arg	G	
G	Val	Ala	Asp	Gly	U	
	Val	Ala	Asp	Gly	C	
	Val	Ala	Glu	Gly	A	
	Val	Ala	Glu	Gly	G	

A strand of mRNA containing the repeating sequence AAGAAGAAGAAG could code for which of the following amino acid sequences?

- A. lys-arg-glu-lys      B. ser-ser-glu-glu  
 C. lys-arg-lys-arg      D. lys-lys-lys-lys

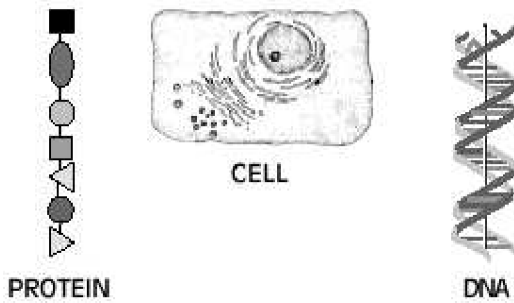
101. The diagram below shows the procedure scientists used to clone a frog from the nucleus of a skin cell.



This procedure is evidence that \_\_\_\_\_.

- A. the nuclei of the skin cells protect the frog  
 B. only skin cells can be used to clone a frog  
 C. the skin cells are the reproductive cells of the frog  
 D. the nuclei of skin cells contain all the DNA needed for a new frog

102.



What is the relationship between the three structures in the diagram above?

- A. DNA is produced by protein which is produced in the cell.
- B. Protein is composed of DNA which is produced in the cell.
- C. DNA controls the production of protein in the cell.
- D. A cell is composed only of DNA and protein.

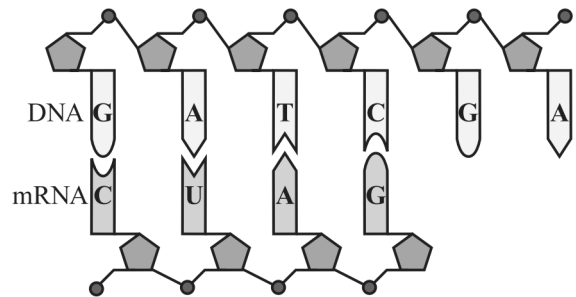
103. The table shows which mRNA codons code for various amino acids.

Which amino acid sequence will be produced by translation of the mRNA sequence UAC UCU ACC?

		Second Position				
		U	C	A	G	
First Position (5' end)	U	Phe Phe Leu Leu	Ser Ser Ser Ser	Tyr Tyr Stop Stop	Cys Cys Stop Trp	U C A G
	C	Leu Leu Leu Leu	Pro Pro Pro Pro	His His Gln Gln	Arg Arg Arg Arg	U C A G
	A	Ile Ile Ile Met	Thr Thr Thr Thr	Asn Asn Lys Lys	Ser Ser Arg Arg	U C A G
	G	Val Val Val Val	Ala Ala Ala Ala	Asp Asp Glu Glu	Gly Gly Gly Gly	U C A G

- A. Asn – Pro – Thr      B. Thr – Pro – Asn
- C. Thr – Ser – Tyr      D. Tyr – Ser – Thr

104. The diagram below shows a strand of DNA matched to a strand of messenger RNA.



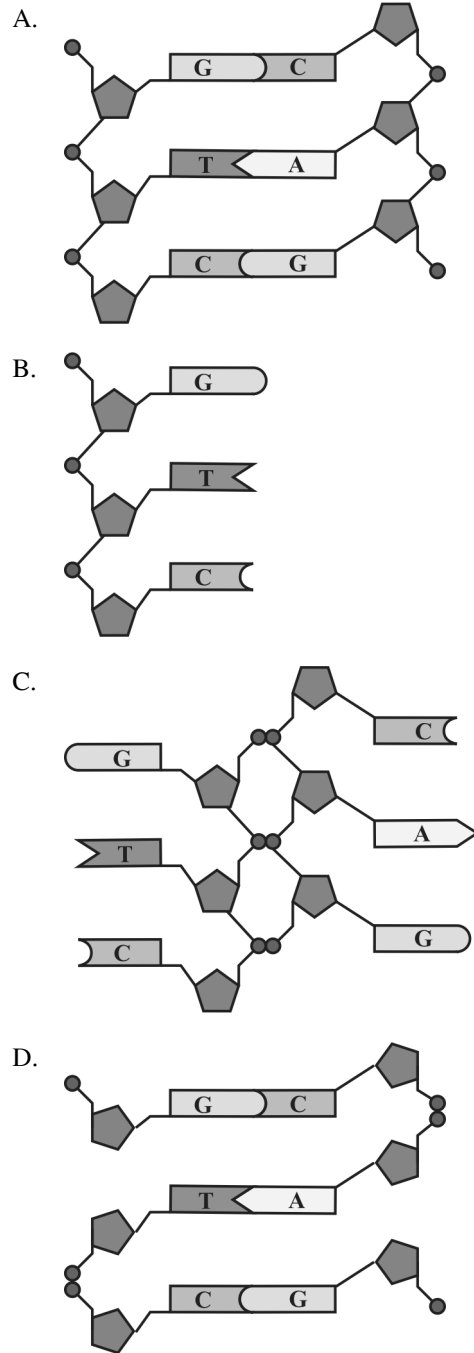
What process does this diagram represent?

- A. mutation                      B. respiration
- C. transcription                D. translation

105. Which of the following *best* describes the result of a mutation in an organism's DNA?

- A. The mutation may produce a zygote.
- B. The mutation may cause phenotypic change.
- C. The mutation causes damage when it occurs.
- D. The mutation creates entirely new organisms.

106. Which of the following models *most* accurately represents the structure of DNA?



107. Scientists create “transgenic” organisms when they transfer genes from one organism to a different kind of organism. Many people marvel at this technology, while others are concerned about its consequences and its effects on society. Which of these is *not* a realistic concern about the formation of “transgenic” organisms?

- A. Transgenic plants may produce chemicals that are harmful to wildlife.
- B. Humans will acquire harmful transgenic traits by consuming transgenic foods.
- C. Eating fruit from transgenic plants could trigger allergies in sensitive individuals.
- D. This technology may be misused or unintentionally used to make products harmful to humans and other organisms.

108. DNA from four organisms was examined using gel electrophoresis. The results are shown in the diagram below.

DNA GEL ELECTROPHORESIS RESULTS

1	2	3	4
—	—	—	—
	—		—
—	—	—	—
—			—
	—	—	—

According to the data, which of these pairs of organisms are *most closely* related?

- A. 1 and 2
- B. 2 and 3
- C. 2 and 4
- D. 3 and 4

109. Look at the illustration below.



This illustration is a model of

- A. RNA
- B. DNA
- C. a lipid
- D. a protein

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1.		15.	
Answer:	C	Answer:	A
Points:	1	Points:	1
2.		16.	
Answer:	D	Answer:	A
Points:	1	Points:	1
3.		17.	
Answer:	C	Answer:	C
Points:	1	Points:	1
4.		18.	
Answer:	B	Answer:	A
Points:	1	Points:	1
5.		19.	
Answer:	D	Answer:	C
Points:	1	Points:	1
6.		20.	
Answer:	C	Answer:	A
Points:	1	Points:	1
7.		21.	
Answer:	C	Answer:	C
Points:	1	Points:	1
8.		22.	
Answer:	C	Answer:	B
Points:	1	Points:	1
9.		23.	
Answer:	A	Answer:	C
Points:	1	Points:	1
10.		24.	
Answer:	B	Answer:	C
Points:	1	Points:	1
11.		25.	
Answer:	B	Answer:	D
Points:	1	Points:	1
12.		26.	
Answer:	B	Answer:	B
Points:	1	Points:	1
13.		27.	
Answer:	A	Answer:	D
Points:	1	Points:	1
14.		28.	
Answer:	D	Answer:	B
Points:	1	Points:	1
		29.	
		Answer:	A
		Points:	1



30.  
Answer: A  
Points: 1

31.  
Answer: A  
Points: 1

32.  
Answer: A  
Points: 1

33.  
Answer: B  
Points: 1

34.  
Answer: D  
Points: 1

35.  
Answer: A  
Points: 1

36.  
Answer: C  
Points: 1

37.  
Answer: C  
Points: 1

38.  
Answer: D  
Points: 1

39.  
Answer: D  
Points: 1

40.  
Answer: B  
Points: 1

41.  
Answer: D  
Points: 1

42.  
Answer: D  
Points: 1

43.  
Answer: A  
Points: 1

44.  
Answer: D  
Points: 1

45.  
Answer: C  
Points: 1

46.  
Answer: B  
Points: 1

47.  
Answer: D  
Points: 1

48.  
Answer: C  
Points: 1

49.  
Answer: B  
Points: 1

50.  
Answer: C  
Points: 1

51.  
Answer: B  
Points: 1

52.  
Answer: C  
Points: 1

53.  
Answer: D  
Points: 1

54.  
Answer: B  
Points: 1

55.  
Answer: B  
Points: 1

56.  
Answer: D  
Points: 1

57.  
Answer: A  
Points: 1

58.  
Answer: D  
Points: 1

59.  
Answer: B  
Points: 1

60.  
Answer: D  
Points: 1

61.  
Answer: C  
Points: 1

62.  
Answer: A  
Points: 1

63.  
Answer: C  
Points: 1

64.  
Answer: A  
Points: 1

65.  
Answer: D  
Points: 1

66.  
Answer: C  
Points: 1

67.  
Answer: D  
Points: 1

68.  
Answer: C  
Points: 1

69.  
Answer: C  
Points: 1

70.  
Answer: A  
Points: 1

71.  
Answer: B  
Points: 1

72.  
Answer: B  
Points: 1

73.  
Answer: C  
Points: 1

74.  
Answer: A  
Points: 1

75.  
Answer: C  
Points: 1

76.  
Answer: C  
Points: 1

77.  
Answer: D  
Points: 1

78.  
Answer: B  
Objective: B.06C  
Points: 1

79.  
Answer: C  
Points: 1

80.  
Answer: B  
Objective: B.06E  
Points: 1

81.  
Answer: A  
Points: 1

82.  
Answer: A  
Points: 1

83.  
Answer: D  
Points: 1

84.  
Answer: D  
Points: 1

85.  
Answer: D  
Points: 1

86.  
Answer: A  
Points: 1

87.  
Answer: D  
Objective: B.06H  
Points: 1

88.  
Answer: B  
Points: 1

89.  
Answer: C  
Points: 1

90.  
Answer: B  
Points: 1

91.  
Answer: D  
Points: 1

92.  
Answer: B  
Points: 1

93.  
Answer: C  
Points: 1

94.  
Answer: C  
Points: 1

95.  
Answer: B  
Points: 1

96.  
Answer: A  
Points: 1

97.  
Answer: B  
Points: 1

98.  
Answer: C  
Points: 1

99.  
Answer: A  
Points: 1

100.  
Answer: D  
Points: 1

101.  
Answer: D  
Points: 1

102.  
Answer:  
Objective: 10.1  
Points: 1

103.  
Answer: D  
Points: 1

104.  
Answer: C  
Objective: MA 3.1  
Points: 1

105.  
Answer: B  
Objective: MA 3.3  
Points: 1

106.  
Answer: A  
Objective: MA 3.1  
Points: 1

107.  
Answer:  
Points: 1

108.  
Answer:  
Points: 1

109.  
Answer:  
Points: 1