



## Dr.G.R.Damodaran College of Science

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II BSC [2016-2019]

SEMESTER III

CORE: MOLECULAR BIOLOGY - 309A

Multiple Choice Questions.

1. One of the functions of DNA is to \_\_\_\_\_ out of the nucleus.

- A. secrete vacuoles
- B. make copies of itself
- C. join amino acids to each other
- D. carry genetic information

ANSWER: D

2. Two sugars found in nucleic acids are \_\_\_\_\_

- A. sucrose and ribose
- B. glucose and fructose
- C. deoxyribose and ribose
- D. deoxyribose and glucose

ANSWER: C

3. The number of adenine bases in a DNA molecule equals the number of thymine bases because \_\_\_\_\_ bonds to thymine on the other strand.

- A. DNA contains equal numbers of all four bases
- B. thymine always follows adenine on each DNA strand
- C. DNA is made of alternating adenine and thymine bases
- D. adenine on one strand

ANSWER: D

4. Which of the following would not occur during complementary base pairing?

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

ANSWER: B

5. Which of the following describes a DNA molecule?

- A. Double helix of glucose sugars and phosphates
- B. Ladder-like structure composed of fats and sugars
- C. Double chain of nucleotides joined by hydrogen bonds
- D. A chain of alternating phosphates and nitrogenous bases

ANSWER: C

6. Which of the following is an example of complementary base pairing?

- A. Thymine-uracil
- B. Guanine-adenine
- C. Adenine-thymine
- D. Cytosine-thymine

ANSWER: C

7. The following are the features of DNA replication EXCEPT

- A. Semi-conservative
- B. Semi-discontinuous
- C. Unidirectional
- D. Chain grow in the 5' ---> 3' direction

ANSWER: C

8. The enzyme responsible for initiating DNA replication in prokaryotes is

- A. DNA polymerase I
- B. DNA polymerase III
- C. Polymerase beta
- D. Primase

ANSWER: D

9. Which of the following statements best describes DNA replication?

- A. tRNA, by complementary base pairing with mRNA, produces proteins
- B. RNA nucleotides, by complementary base pairing with DNA, produce DNA
- C. DNA nucleotides, by complementary base pairing with DNA, produce DNA
- D. RNA nucleotides, by complementary base pairing with DNA, produce tRNA

ANSWER: C

10. The base found in RNA nucleotides but not in DNA nucleotides is \_\_\_\_\_

- A. uracil (U)
- B. adenine (A)
- C. guanine (G)
- D. cytosine (C)

ANSWER: A

11. Which of one the following type of ribosome is found in humans?

- A. 70S
- B. 80S
- C. 50S
- D. 40S

ANSWER: B

12. Which of the following type of rRNA is not found in eukaryotic ribosome?

- A. 28S
- B. 5.8S
- C. 5S
- D. 16S

ANSWER: D

13. Initiator tRNA binds at which of the following sites of ribosomes?

- A. A site
- B. P site
- C. E site
- D. F site

ANSWER: B

14. Which one of the following arm of tRNA helps in binding with the ribosome during protein synthesis?

- A. Acceptor arm
- B. Dihydrouracil arm.
- C. Extra arm
- D. T and C arm

ANSWER: D

15. Which one of the following arm of tRNA helps in the formation of tertiary structure of the molecule?

- A. Acceptor arm
- B. Dihydrouracil arm

- C. Extra arm
- D. Anticodon arm.

ANSWER: C

16. Shine-Delgarno sequence is present in which of the following RNA?

- A. tRNA
- B. mRNA
- C. rRNA
- D. SnRNA

ANSWER: B

17. Which one of the following is absent in a typical prokaryotic mRNA?

- A. Leader sequence
- B. Intercistronic region
- C. Intron
- D. Tailer

ANSWER: C

18. Which one of the following change occurs in primary transcript (hnRNA) of eukaryotes?

- A. Addition of 7-methyl g n uanosine cap at 5prime end
- B. Addition of poly(A) tail at 3 prime end
- C. Removal of introns
- D. All of the above

ANSWER: D

19. Which one of the following splicing reaction (connecting exons via removal of introns) occur in eukaryotes?

- A. By RNA itself due to formation of secondary structure
- B. By spliceosomes
- C. By splicing endonuclease and ligation activity
- D. Any of the above

ANSWER: D

20. RNA polymerase III of eukaryotes synthesizes \_\_\_\_\_

- A. t RNA
- B. 5srRNA
- C. SnRNA
- D. All of the above

ANSWER: D

21. Determine the sequence of amino acids produced by this DNA sequence: GGAGTTTTC

- A. Proline, Valine, Lysine
- B. Glycine, Valine, Leucine
- C. Proline, Glutamine, Lysine
- D. Glycine, Glutamic acid, Leucine

ANSWER: B

22. Enhancer regions in eukaryotic DNA are

- A. DNA pol I binding site
- B. Inhibit the binding of repressor
- C. Echance the frequence of transcription
- D. Specific for given set of genes

ANSWER: C

23. The tRNA anticodon for the DNA sequence AGT would be \_\_\_\_\_

- A. UCA
- B. AGU
- C. TCA

D. AGT

ANSWER: A

24. A change in the sequence of bases in a strand of DNA that occurs as a result of exposure to X-rays is an example of \_\_\_\_\_

- A. mutation.
- B. denaturation
- C. transcription
- D. protein synthesis

ANSWER: A

25. For a substance to be classified as a mutagen, it must cause \_\_\_\_\_

- A. a change in DNA
- B. enzymes to denature
- C. hydrolysis of proteins
- D. mRNA to be produced

ANSWER: A

26. Which of the following would be a result of the substitution of one base pair in DNA by a different base pair during replication?

- A. A mutation would occur
- B. tRNA would bond to DNA
- C. Phosphate would join with adenine
- D. Uracil would appear in the DNA strand

ANSWER: A

27. Recombinant DNA is defined as DNA produced from \_\_\_\_\_

- A. RNA and a protein
- B. DNA and hemoglobin
- C. viral DNA and glucose
- D. DNA of two different organisms

ANSWER: D

28. In contrast to DNA polymerase, RNA polymerase

- A. Fills in the gap between okazaki fragments
- B. Works only in 5' to 3' direction
- C. Edits as it synthesizes
- D. Synthesizes RNA primer to initiate DNA synthesis

ANSWER: D

29. A \_\_\_\_\_ is a structure of DNA, protein, and RNA found in cells.

- A. RNA
- B. DNA
- C. chromosome
- D. All the above

ANSWER: C

30. A role of mRNA in protein synthesis is to \_\_\_\_\_

- A. form ribosomes
- B. form the protein tertiary structure
- C. carry appropriate amino acids into place
- D. carry genetic information out of the nucleus

ANSWER: D

31. The elongation factor of the ternary complex in eukaryotes is \_\_\_\_\_

- A. eEF-1
- B. eEF-2
- C. eEF-3

D. eEF-4

ANSWER: A

32. Peptidyl transferase activity of eukaryotic 60S subunit is inhibited by

A. \chloramphenical

B. cycloheximide

C. erythromycin

D. streptomycin

ANSWER: B

33. Which one of the following inhibitors binds to the A sites on ribosome and inhibits entry of aminoacyl-tRNA both in bacterial and mammalian cells?

A. Puramycin

B. Ricin

C. Sarcin

D. Sparsomycin

ANSWER: A

34. Diptheria toxin inhibits translation by binding with \_\_\_\_\_.

A. eIF-2

B. eEF-2

C. eEF-1

D. eIF-1

ANSWER: B

35. Which one of the following is INCORRECT about Chaperones?

A. They are proteins that help in correct folding of target proteins

B. Chaperones act on newly synthesized or denatured proteins or protein passing through the membranes

C. Heat shock proteins are examples of Chaperones

D. Chaperones do not require ATP energy for their function

ANSWER: D

36. Which one of the following protein or enzyme is involved in protein folding?

A. Protein disulphide isomerase

B. Peptidyl proline isomerase

C. Immunoglobulin binding protein

D. All of the above

ANSWER: D

37. Which one of the following disease is caused by abnormal folding of a normal protein?

A. Crulutzfeldt-Jacob disease

B. Kuru disease

C. Mad Cow disease

D. All of the above

ANSWER: D

38. How do the zymogens like trypsinogen and chymotrypsinogen are modified post-translationally?

A. By covalent modification

B. By porteolytic processing

C. By removal of N-terminal methionine

D. By formation of disulphide cross links between polypeptides

ANSWER: B

39. Which of the following is a covalent modification of proteins post translationally?

A. Phosphorylation and hydroxylation of specific aminoacids

B. Glycosylation

C. Addition of prosthetic group

D. All of the above

ANSWER: D

40. Transportation of proteins into which of the following cell organelles requires a carrier protein?

A. Endoplasmic reticulum

B. Mitochondria

C. Peroxisome

D. Chloroplast

ANSWER: C

41. An organelle composed of a stack of flattened saccules may function to \_\_\_\_\_

A. propel the cell

B. replicate DNA

C. produce glucose

D. package proteins

ANSWER: D

42. In which one of the following organelles is light energy used to produce simple sugars?

A. Lysosomes

B. Chloroplasts

C. Mitochondria

D. Endoplasmic reticulum

ANSWER: B

43. Which of the following organelles is correctly matched with its product?

A. nucleolus - DNA

B. mitochondria - ATP

C. Golgi apparatus - lipid

D. smooth endoplasmic reticulum - protein

ANSWER: B

44. Which of the following is found in both prokaryotic and eukaryotic cells?

A. Nucleus

B. Ribosome

C. Lysosome

D. Mitochondrion

ANSWER: B

45. The part of the bacterial RNA polymerase responsible for the recognizing the promoter is the

A. Alpha subunit

B. Rho protein

C. DNA pol III

D. Sigma subunit

ANSWER: D

46. During daylight hours, green plants carry on \_\_\_\_\_

A. respiration only

B. photosynthesis only

C. respiration and fermentation

D. photosynthesis and respiration

ANSWER: A

47. What is the sequence of organelles that a secreted protein would have passed through on its journey out of a cell?

A. Mitochondria, Golgi apparatus, cell membrane

B. Cell membrane, mitochondria, Golgi apparatus

C. Golgi apparatus, rough endoplasmic reticulum, cell membrane

D. Rough endoplasmic reticulum, Golgi apparatus, cell membrane

ANSWER: D

48. The fluid-mosaic membrane model describes the membrane as having a \_\_\_\_\_

- A. sheet of protein
- B. phospholipid bilayer
- C. sugar-phosphate backbone
- D. complementary base template

ANSWER: B

49. Molecules in the cell membrane that function as receptors are \_\_\_\_\_

- A. proteins
- B. glycerol
- C. cholesterol
- D. phospholipids

ANSWER: A

50. The oncogene Ras binds:

- A. ATP
- B. GTP
- C. Glucose
- D. Hemoglobin

ANSWER: B

51. The proteins that is associated with the transition of one phase of cell cycle to another

- 
- A. Cyclins
  - B. Nuclins
  - C. phospins
  - D. isophospins

ANSWER: A

52. Name the DNA sequence that prevents the continuous loss of DNA at the end of the chromosome during the course of replication?

- A. Okazaki
- B. Telomere
- C. Octomere
- D. Heteromere

ANSWER: B

53. The mobile segments of DNA are called \_\_\_\_\_

- A. Retroposons
- B. Transposons
- C. Introns
- D. Exons

ANSWER: B

54. Any change in the DNA sequence of a gene is commonly referred to as \_\_\_\_\_

- A. Mutation
- B. Transposition
- C. transversion
- D. retrotransposition

ANSWER: A

55. In mismatch repair mechanism, the endonuclease activity which cut the nascent DNA strand is done by

- A. MutH
- B. MutL
- C. MutS
- D. UvrD

ANSWER: A

56. One common example of inherited cancer with faulty mismatch repair of defective DNA \_\_\_\_\_

- A. colon cancer
- B. mammary cancer
- C. thyroid cancer
- D. breast cancer

ANSWER: A

57. The total DNA contained in an organism is referred to as \_\_\_\_\_

- A. Gene
- B. Genome
- C. Hereditary unit
- D. DNA

ANSWER: B

58. The primary transcript produced by RNA polymerase II in eukaryotes \_\_\_\_\_

- A. mRNA
- B. SnRNA
- C. hnRNA
- D. rRNA

ANSWER: C

59. The intervening nucleotide sequences in mRNA that do not code for proteins \_\_\_\_\_

- A. Exons
- B. Transcript
- C. Fragments
- D. Introns

ANSWER: D

60. The synthesis of complementary DNA from mRNA is catalysed by the enzyme \_\_\_\_\_

- A. Transcriptase
- B. reverse transcriptase
- C. Helicase
- D. Gyrase

ANSWER: B

61. Nucleosomes

- A. Bind to RNA Pol II
- B. Package prokaryotic DNA
- C. Are only present in prokaryotes
- D. Are composed of an octomer of histones and ~ 150 bp of DNA

ANSWER: D

62. Which of the following type of rRNA is not found in eukaryotic ribosome?

- A. 28S
- B. 5.8S
- C. 5S
- D. 16S

ANSWER: D

63. Which one of the following arm of tRNA helps in binding with the ribosome during protein synthesis?

- A. Acceptor arm
- B. Dihydrouracil arm
- C. Anticodon loop
- D. T ? C arm

ANSWER: C

64. Shine-Dalgarno sequence is present in which of the following RNA?

- A. tRNA
- B. mRNA
- C. rRNA
- D. SnRNA

ANSWER: B

65. Which one of the following change occurs in primary transcript (hnRNA) of eukaryotes?

- A. Addition of 7-methyl guanosine cap at 5' end
- B. Addition of poly(A) tail at 3' end
- C. Removal of introns
- D. All of the above

ANSWER: D

66. RNA polymerase III of eukaryotes synthesizes \_\_\_\_\_

- A. tRNA
- B. 5srRNA
- C. SnRNA
- D. All of the above

ANSWER: A

67. Which of the following sequence is absent in a typical prokaryotic promoter?

- A. TTGACA sequence at -35 position
- B. TATA sequence at -25 position
- C. TATAAT sequence -10 sequence
- D. CAT sequence at start point

ANSWER: B

68. Which one of the following is NOT the upstream sequence element of the promoter region of RNA Pol II?

- A. Enhancer
- B. GC box
- C. CAAT box
- D. Octamer

ANSWER: D

69. Which one of the following factors is not the part of basal initiation complex?

- A. TFIIA
- B. TFIIB
- C. TFII E
- D. TFIIF

ANSWER: A

70. Centromeres are found to contain specific DNA sequences with special proteins bound to them forming a disc shaped structure called \_\_\_\_\_

- A. Kinetochore
- B. chromosome
- C. DNA
- D. RNA

ANSWER: A

71. Mitochondrial DNA is inherited from \_\_\_\_\_

- A. mother only
- B. father only
- C. both of them
- D. either mother or father

ANSWER: A

72. The number of genes found in human genome \_\_\_\_\_

- A. 10,000-20,000
- B. 20,000-30,000
- C. 30,000-40,000
- D. 40,000-50,000

ANSWER: C

73. The genes responsible for the production of proteins that are required all the time in a cell are regarded as \_\_\_\_\_

- A. constitutive gene
- B. suppressive gene
- C. dominative gene
- D. substitute gene

ANSWER: A

74. The earlier concept of one gene-one enzyme is replaced by \_\_\_\_\_

- A. one intron-one subunit concept
- B. one exon-one subunit concept
- C. one cistron-one subunit concept
- D. one haploid-one subunit concept

ANSWER: C

75. Which of the following mRNAs lack poly A tail?

- A. Ferritin
- B. Interferon
- C. Insulin
- D. None of the above

ANSWER: B

76. The structural Z gene of lactose operon is responsible for the synthesis of \_\_\_\_\_ enzyme

- A. beta galactosidase
- B. Permease
- C. Acetylase
- D. All of them

ANSWER: A

77. Methylation of DNA results in \_\_\_\_\_

- A. Activation of genes
- B. Inactivation of genes
- C. No effect on genes
- D. Inactivation of protein motifs

ANSWER: B

78. The production of a wide range of immunoglobulins is explained on the basis of \_\_\_\_\_

- A. gene amplification
- B. gene rearrangement
- C. alternate mRNA splicing
- D. mRNA degradation

ANSWER: A

79. The specific control of transcription involves the \_\_\_\_\_ motif

- A. helix-turn-helix
- B. zinc finger
- C. leucine zipper
- D. all of them

ANSWER: C

80. Which of the following is not a cloning vector?

- A. Helicases
  - B. PBR322
  - C. SV40
  - D. E.coli genomic DNA
- ANSWER: A

81. The repeat sequence of nucleotides in telomeres is \_\_\_\_\_
- A. TTGGGA
  - B. TTAGGG
  - C. GGGATT
  - D. TTGAGG
- ANSWER: B

82. The DNA damage caused by deamination is an example of \_\_\_\_\_
- A. single base alteration
  - B. two base alteration
  - C. chain breaks
  - D. cross linkage
- ANSWER: A

83. The mutation involving the replacement of one purine by another \_\_\_\_\_
- A. frameshift mutation
  - B. Transition
  - C. Transversion
  - D. none of the above
- ANSWER: B

84. The proteins that is associated with the transition of one phase of cell cycle to another \_\_\_\_\_
- A. Cyclins
  - B. Nuclins
  - C. Phospins
  - D. Isophospins
- ANSWER: A

85. Name the DNA sequence that prevents the continuous loss of DNA at the end of the chromosome during the course of replication?
- A. Okazaki
  - B. Telomere
  - C. Octomere
  - D. Heteromere
- ANSWER: A

86. The mobile segments of DNA are called \_\_\_\_\_
- A. Retroposons
  - B. Transposons
  - C. Introns
  - D. Exons
- ANSWER: B

87. Any change in the DNA sequence of a gene is commonly referred to as \_\_\_\_\_
- A. Mutation
  - B. Transposition
  - C. Transversion
  - D. Retrotransposition
- ANSWER: A

88. The total DNA contained in an organism is referred to as \_\_\_\_\_

- A. Gene
- B. Genome
- C. Hereditary unit
- D. DNA

ANSWER: B

89. The primary transcript produced by RNA polymerase II in eukaryotes \_\_\_\_\_

- A. mRNA
- B. SnRNA
- C. hnRNA
- D. rRNA

ANSWER: A

90. The binding of the DNA dependent RNA polymerase to promoter site is inhibited by

- A. Streptomycin
- B. Puromycin
- C. Rifampicin
- D. Tetracycline

ANSWER: C

91. What are the essential characteristics of a cloning vector?

- A. Bacterial cells cannot survive without it
- B. Bacterial cells replicate it
- C. Bacterial cells take it up
- D. Both b and c

ANSWER: B

92. Which bacteria is known as natural genetic engineer of plants?

- A. Agrobacterium tumefaciens
- B. E.coli
- C. Bacillus
- D. Streptomyces

ANSWER: A

93. Who coined the term plasmid?

- A. Herbert boyer
- B. Lederberg
- C. Stanley
- D. Benthem

ANSWER: B

94. Post transcriptional modification to the 3'-end of eukaryotic mRNAs What is added to the 3'-end of many eukaryotic mRNAs after transcription?

- A. Introns
- B. Poly A tail
- C. A cap structure
- D. The trinucleotide CCA

ANSWER: B

95. Which of the following is an accurate statement concerning the differences between DNA and RNA?

- A. RNA is usually ds, but DNA is usually ss
- B. RNA has the sugar deoxyribose, but DNA has the sugar ribose
- C. RNA contains three different nucleotides, but DNA contains four different nucleotides
- D. RNA lacks the base thymine and has uracil instead

ANSWER: D

96. DNA helicase enzyme involved in base excision repair mechanism is

- A. DNA helicase I

- B. DNA helicase II
- C. DNA helicase III
- D. DNA helicase IV

ANSWER: C

97. The cells in your skin have a different shape and different function from the cells in your liver because the two types of cells have different \_\_\_\_\_

- A. lipids
- B. proteins
- C. DNA
- D. carbohydrates

ANSWER: C

98. Genetic recombination (crossing over) produces \_\_\_\_\_

- A. new chromosomes
- B. mutations
- C. longer chromosomes
- D. new combinations of alleles

ANSWER: D

99. Which one of the following statements is true?

- A. An allele is either dominant or recessive, not in between
- B. A particular gene can have only two alleles
- C. A single trait can be affected by many different genes
- D. The environment is irrelevant to gene expression

ANSWER: B

100. All of the following are used in PCR, EXCEPT

- A. Taq polymerase
- B. Restriction enzymes
- C. Oligonucleotide primers
- D. Deoxynucleoside triphosphates

ANSWER: B

101. Methylation of DNA results in \_\_\_\_\_

- A. Activation of genes
- B. Inactivation of genes
- C. No effect on genes
- D. Inactivation of protein motifs

ANSWER: B

102. Post transcriptional modification to the 3'-end of eukaryotic mRNAs. What is added to the 3'-end of many eukaryotic mRNAs after transcription?

- A. Introns
- B. Poly A tail
- C. A cap structure
- D. The trinucleotide CCA

ANSWER: B

103. The DNA sequence of a codon in a gene was changed from AAT to AAC. This type of mutation is called a(n) \_\_\_\_\_

- A. frameshift mutation
- B. point mutation
- C. insertion mutation
- D. deletion mutation

ANSWER: B

104. What are restriction enzymes?

- A. That are limited in how big they can become
  - B. Vitamins such as vitamin A
  - C. Plasmids
  - D. That cleave through a DNA helix wherever they encounter a specific sequence of nucleotides
- ANSWER: D

105. The two strands of DNA are held together by \_\_\_\_\_ bonds

- A. Covalent
  - B. Polar
  - C. Nonpolar
  - D. Hydrogen
- ANSWER: D

106. Griffith discovered the transforming ability of the genetic material while studying the \_\_\_\_\_

- A. virus that causes measles
  - B. bacteria that cause pneumonia
  - C. genetics of mice
  - D. x-ray diffraction pattern of DNA
- ANSWER: B

107. A nonsense mutation generally results in \_\_\_\_\_

- A. translation of incorrect amino acids
  - B. a shorter polypeptide
  - C. no change in expressed protein
  - D. a frameshift
- ANSWER: B

108. The function of single-strand binding proteins in DNA replication is to \_\_\_\_\_

- A. break the hydrogen bonds linking complementary bases
  - B. prevent the replication fork from unwinding too fast
  - C. hold the unwound single strands apart
  - D. attach to the lagging strand so that it does not get too far behind
- ANSWER: C

109. Which of the following is NOT correct?

- A. There are sixty-four different codons
  - B. All codons specify a specific amino acid
  - C. Some codons are used for initiation or termination of a gene
  - D. There are more codons than amino acids so that the code is redundant
- ANSWER: B

110. Which is NOT an activity of DNA polymerase during DNA replication?

- A. Continuous 5' to 3' DNA synthesis of the leading strand
  - B. Discontinuous 5' to 3' DNA synthesis of the lagging strands
  - C. 3' to 5' proofreading and 5' to 3' correction of errors
  - D. 5' to 3' synthesis of RNA primer
- ANSWER: D

111. The endonuclease BamHI was originally isolated from \_\_\_\_\_

- A. Escherichia coli
  - B. Bacillus amyloliquefaciens
  - C. Saccharomyces cerevisiae
  - D. Bameilluis pombe
- ANSWER: D

112. In blue-white screening of bacterial colonies, a white colony usually indicates that \_\_\_\_\_

- A. The bacteria was transformed with a plasmid that does not contain a DNA insert

- B. The bacteria was transformed with a plasmid containing a DNA insert
- C. The bacteria was not transformed
- D. The bacteria was transformed with multiple non-recombinant plasmids

ANSWER: B

113. Out of the following, one class of RNA characteristically contains unusual purines and pyrimidines. This RNA is

- A. t RNA
- B. r RNA
- C. m RNA
- D. 16s RNA

ANSWER: A

114. During DNA replication, each strand acts as a \_\_\_\_\_ for the generation of a new \_\_\_\_\_

- A. replicate, complementary strand
- B. template, identical strand
- C. origin, double helix
- D. template, complementary strand

ANSWER: D

115. The human genome contains \_\_\_\_\_ chromosomes

- A. 12 linear
- B. 23 haploid
- C. 46 haploid
- D. 24 linear

ANSWER: B

116. Replication origins tend to be \_\_\_\_\_ rich

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

ANSWER: C

117. Which of the following is NOT a feature of eukaryotic gene expression?

- A. Polycistronic mRNAs are very rare
- B. RNA synthesis and protein synthesis are coupled as in prokaryotes
- C. Many genes are interrupted by noncoding DNA sequences
- D. mRNA is often extensively modified before translation

ANSWER: B

118. The primary RNA transcript of the chicken ovalbumin gene is 7700 nucleotides long, but the mature mRNA that is translated on the ribosome is 1872 nucleotides long. This size difference occurs primarily as a result of \_\_\_\_\_

- A. capping
- B. removal of poly A tails
- C. reverse transcription
- D. Splicing

ANSWER: D

119. RNAs that catalyze biological reactions, such as self-splicing introns, are known as

- A. Enzymes
- B. Spliceosomes
- C. Ribozymes
- D. mature RNAs

ANSWER: B

120. Which of the following represents the sequence of events during mitosis?

- A. prophase - metaphase - anaphase - telophase
- B. interphase - metaphase - anaphase - telophase
- C. anaphase - telophase - metaphase - interphase
- D. interphase - prophase - anaphase - metaphase

ANSWER: A

121. If a cell is in G<sub>2</sub> \_\_\_\_\_

- A. it has twice the amount of DNA present in a telophase nucleus
- B. it has visibly distinct chromosomes
- C. it lacks a visible nuclear membrane
- D. it is in mitosis

ANSWER: A

122. The \_\_\_\_\_ is responsible for the separation of the chromosomes during \_\_\_\_\_ of mitosis

- A. cell wall; anaphase
- B. flagellum; metaphase
- C. mitotic spindle; anaphase
- D. centromere; telophase

ANSWER: C

123. \_\_\_\_\_ contain identical DNA sequences and are held together by \_\_\_\_\_ during mitosis

- A. Daughter chromosomes; hydrogen bonding
- B. Daughter chromosomes; ionic bonding
- C. Sister chromosomes; histone proteins
- D. Sister chromatids; centromeres

ANSWER: D

124. The mitotic spindle is made of \_\_\_\_\_.

- A. collagen
- B. condensin
- C. histones
- D. microtubules

ANSWER: D

125. The kinetochore serves which of the following functions?

- A. Kinetochores anchor spindle fibers to the centrioles
- B. Kinetochores are the site of DNA synthesis
- C. Kinetochores regulate the length of the cell cycle
- D. Kinetochores attach to microtubules during mitosis

ANSWER: D

126. All of the following events occur during prometaphase EXCEPT:

- A. the nuclear envelope breaks down
- B. the nucleoli disappear
- C. the mitotic spindle is completely assembled
- D. the spindle fibers 'capture' chromosomes

ANSWER: C

127. Duplicated centrioles move to opposite poles of a dividing \_\_\_\_\_ cell during \_\_\_\_\_ of the cell cycle

- A. plant; metaphase
- B. plant; anaphase
- C. animal; interphase
- D. animal; prophase

ANSWER: D

128. Chromosomes are condensed to their greatest extent during \_\_\_\_\_ of mitosis

- A. Metaphase
- B. Prophase
- C. Telophase
- D. Interphase

ANSWER: A

129. Cytokinesis in plant cell mitosis occurs initially by the formation of a(n): \_\_\_\_\_

- A. aster
- B. mitotic spindle
- C. cell wall
- D. cell plate

ANSWER: D

130. The completion of the S phase of the cell cycle of a mammalian cell is marked by all of the following EXCEPT \_\_\_\_\_

- A. histone content per cell is double that of cells in G1
- B. in replicated DNA, newly incorporated bases are paired with parental bases
- C. each replicated chromosome has four telomeres
- D. sister chromatids disjoin from one another

ANSWER: D

131. All of the following contribute to promoter binding by RNA polymerase in *E. coli* EXCEPT the \_\_\_\_\_

- A. rho factor
- B. -10 consensus sequence
- C. -35 consensus sequence
- D. initiation factor

ANSWER: A

132. Zinc fingers are important in cellular regulation because they are \_\_\_\_\_

- A. at the catalytic site of many kinases
- B. a structural motif in many DNA-binding proteins
- C. structures with high redox potential
- D. characteristic of palindromic stretches of unique-sequence DNA

ANSWER: B

133. Common lesions found in DNA after exposure to ultraviolet light are \_\_\_\_\_

- A. pyrimidine dimers
- B. purine dimers
- C. single strand breaks
- D. base deletions

ANSWER: A

134. Some viruses have increased the coding potential of their genome by

- A. integrating into the host genome
- B. using host ribosomes for translation
- C. using alternative splicing sites
- D. using a degenerate triplet code

ANSWER: D

135. Which one of the following is most likely to lead to a loss of gene function?

- A. A missense mutation in the ORF
- B. A change from a TAA codon to a TAG codon in the coding region
- C. A change from T to C in the promoter region
- D. A frameshift mutation in the coding region

ANSWER: D

136. A solution contains DNA polymerase I, Mg<sup>2+</sup> salts of dATP, dGTP, dCTP and dTTP and an appropriate buffer. Which of the following DNA molecules would serve as a template for DNA synthesis when added to this solution?

- A. A single stranded closed circle
- B. A single stranded closed circle base-paired to a shorter linear strand with a 3' terminal hydroxyl
- C. A double stranded closed circle
- D. A single stranded closed circle base paired to a shorter linear strand with a 3' terminal phosphate

ANSWER: B

137. Which out of the following mechanisms is involved in the production of variety of immunoglobulins each specific for a specific antigen?

- A. Class switching
- B. Gene amplification
- C. Gene rearrangement
- D. RNA editing

ANSWER: C

138. Which of the following best describes the function of the sigma subunit in the RNA polymerase of E.coli?

- A. It is essential for elongation of the RNA transcript
- B. It is essential for the recognition of and binding to the promoter sequence
- C. It is required for transcription termination
- D. It keeps the core complex from dissociating

ANSWER: B

139. When bacteriophage lambda infects a sensitive bacterium, one of the first messenger RNA species synthesized is very short, beginning at a site PL and extending just through an adjacent gene N. After the appearance of the gene N protein, messages become much longer, still beginning at PL but extending far beyond gene N. The N gene encodes

- A. an antiterminator acting just beyond gene N
- B. a new sigma factor acting on a promoter beyond gene N
- C. an activator for a promoter beyond gene N
- D. a protein that stabilizes the longer message

ANSWER: A

140. During which of the following stages of meiosis do the sister centromeres separate?

- A. metaphase I
- B. anaphase I
- C. metaphase II
- D. anaphase II

ANSWER: D

141. Which of the following events does not occur in prophase II?

- A. formation of the spindle
- B. condensation of chromatin into chromosomes
- C. formation of chiasmata
- D. removal of the nuclear membrane

ANSWER: B

142. What is the source of the repair template during excision repair?

- A. There is none, since repair is by direct reversal
- B. The strand complementary to the damaged DNA
- C. The sister chromatid of the damaged DNA
- D. The homologue of the damaged DNA

ANSWER: D

143. All of the statements about the 3' to 5' exonuclease found in many DNA polymerases are true EXCEPT?

- A. It acts as a proofreader, primarily for the most recently added base
- B. It is separated from the polymerase active site
- C. It is different from the 5' to 3' exonuclease
- D. It only removes mismatched bases when the polymerase is not functioning

ANSWER: D

144. A 20 year old man was diagnosed with abnormal form of  $\beta$  - globulin (hemoglobin constant spring) which is longer than the normal protein, which of the following point mutation is consistent with the abnormality?

- A. UAA ----> CAA
- B. CGA----> UGA
- C. UAA----> UAG
- D. GAC----> UAC

ANSWER: A

145. Which ONE of the following reactions DOES NOT require the energy of ATP hydrolysis?

- A. Binding of UvrA and UvrB to a UV-induced DNA lesion
- B. Formation of the MutS, MutL, MutH complex
- C. Photoreactivation of a thymine dimer
- D. Binding of RecA to single-strand DNA

ANSWER: C

146. Which one of the following statements regarding the SOS error-prone repair system is FALSE:

- A. many repair genes are induced by cleavage of LexA
- B. Damage that blocks replication and leads to exposure of single-strand DNA induces the system
- C. RecA must help to cleave LexA and activate the system
- D. This error prone repair system primarily results in frameshift mutations

ANSWER: B

147. The one FALSE statement about homologous recombination is \_\_\_\_\_

- A. In general the closer two genes are to one another physically, the less likely it is that recombination will occur between them
- B. Crossing-over during the prophase of meiosis It is important for normal chromosome segregation
- C. Regions of heteroduplex DNA results from branch migration
- D. The same proteins that carry out homologous recombination are also necessary for nonhomologous recombination

ANSWER: D

148. The RNA synthesis is NOT inhibited by \_\_\_\_\_

- A. Zidovudine
- B. Actinomycin D
- C. Rifambin
- D. Alpha-Amanitin

ANSWER: A

149. Which statement is FALSE about patch recombinants and splice recombinants?

- A. Patch recombinants lead to crossover products
- B. Splice recombinants contain a region of heteroduplex DNA
- C. Both can be formed using either the original Holliday model or the double strand break repair model
- D. In splice recombinants all four strands cut and rejoined

ANSWER: A

150. Which out of the following is an example of post translational modification?

- A. Splicing
- B. Class switching
- C. Subunit aggregation
- D. Base modification

ANSWER: C

151. During cytokinesis in plant cells, the cell plate is formed by the fusion of vesicles derived from which of the following?

- A. Microtubules
- B. The cell wall
- C. The golgi complex
- D. The plasma membrane

ANSWER: C

152. Which of the following is NOT a property of the mammalian signal recognition particle?

- A. a secretory polypeptides to the RER
- B. It contains a signal peptidase activity
- C. It temporarily arrests translation
- D. It contains both RNA and several polypeptides

ANSWER: B

153. The ribosome is involved in all of the following EXCEPT

- A. peptide bond formation
- B. binding of protein factors during elongation
- C. aminoacylation of tRNA
- D. binding of mRNA at an initiation codon

ANSWER: C

154. An E.coli strain lacking DNA polymerase I would be deficient in DNA \_\_\_\_\_.

- A. repair
- B. Methylation
- C. Splicing
- D. Degradation

ANSWER: A

155. The expression of the trp operon in E.coli is regulated in part by the availability of the amino acid tryptophan. This regulatory process is referred to as

- A. antitermination
- B. attenuation
- C. translational read-through
- D. nonsense suppression

ANSWER: B

156. Which one of the following elements is LEAST likely to be found on any +strand viral genomic RNA?

- A. A cap
- B. A packaging site
- C. A binding site for ribosomes
- D. A binding site for RNA polymerase II

ANSWER: D

157. Site of synthesis of histone mRNA

- A. nuclear envelope
- B. nucleolus
- C. euchromatin
- D. heterochromatin

ANSWER: C

158. Site of transcriptionally inactive DNA

- A. nuclear envelope
- B. nucleolus
- C. euchromatin

D. heterochromatin

ANSWER: D

159. Which of the following is NOT a potential problem associated with expressing a eukaryotic, protein coding nuclear gene in prokaryotic cells?

- A. Lack of an intron-splicing mechanism in prokaryotes
- B. Differences in the translation initiation codons used by eukaryotic cells and prokaryotic cells
- C. Stability of mRNA in prokaryotic cells
- D. Susceptibility of the protein product to prokaryotic proteases

ANSWER: C

160. Actin filaments and microtubules share all of the following properties EXCEPT \_\_\_\_\_

- A. they are involved in cell motility
- B. they can be cross linked into bundles
- C. they are assembled from subunits that are heterodimers
- D. they can associate with motor proteins

ANSWER: B

161. During cytokinesis in plant cells, the cell plate is formed by the fusion of vesicles derived from which of the following?

- A. Microtubules
- B. The cell wall
- C. The golgi complex
- D. The plasma membrane

ANSWER: B

162. The ribosome is involved in all of the following EXCEPT \_\_\_\_\_

- A. peptide bond formation
- B. binding of protein factors during elongation
- C. aminoacylation of tRNA
- D. binding of mRNA at an initiation codon

ANSWER: C

163. Alternate splicing....

- A. Creates protein from multiple segment of DNA on different chromosomes
- B. Is the reason why the human genome is much more complex than other species
- C. creates different proteins from a single gene
- D. is not tissue specific

ANSWER: C

164. Site of transcriptionally inactive DNA \_\_\_\_\_

- A. nuclear envelope
- B. nucleolus
- C. euchromatin
- D. heterochromatin

ANSWER: D

165. Site of protein synthesis is \_\_\_\_\_

- A. nuclear envelope
- B. nucleolus
- C. euchromatin
- D. heterochromatin

ANSWER: A

166. Site of transcription by RNA polymerase II is \_\_\_\_\_

- A. nuclear envelope
- B. nucleolus
- C. euchromatin

D. nucleus

ANSWER: D

167. Restriction enzymes have been found in \_\_\_\_\_

A. humans

B. birds

C. bacteriophages

D. bacteria

ANSWER: D

168. The genetic code operates through \_\_\_\_\_

A. the protein moiety of DNA

B. cistron of DNA

C. nucleotide sequence of mRNA

D. the anticodons of tRNA

ANSWER: C

169. From DNA the genetic message is transcribed into \_\_\_\_\_

A. mRNA

B. rRNA

C. protein

D. tRNA

ANSWER: A

170. This compound has a double-helical structure.

A. RNA

B. DNA

C. FAD

D. NAD

ANSWER: B

171. The structural stability of the double helix of DNA is ascribed largely to \_\_\_\_\_

A. hydrogen bonding between adjacent purine bases

B. hydrophobic bonding between stacked purine and pyrimidine

C. hydrogen bonding between adjacent pyrimidine bases

D. hydrogen bonding between adjacent purine and pyrimidine bases

ANSWER: D

172. Which one of the following statements about nucleic acid is most correct?

A. both pentose nucleic acid and deoxyntose nucleic acid contain the same pyrimidines

B. both pentose nucleic acid and deoxyntose nucleic acid contain the same purines

C. RNA contains cytosine and thymine

D. DNA and RNA are hydrolyzed by weak alkali

ANSWER: B

173. Acid hydrolysis of RNA would yield the following major products \_\_\_\_\_

A. deoxyribose, cytosine, adenine

B. deoxyribose, thymine, guanine

C. deoxyribose, cytosine, uracil, thymine

D. deoxyribose, uracil, adenine, guanine, cytosine

ANSWER: D

174. RNA does not contain \_\_\_\_\_

A. adenine

B. hydroxymethyl cytosine

C. Deoxyribose

D. Uracil

ANSWER: B

175. Histones have an abundance of which of the following amino acids?

- A. Lysine and arginine
- B. Alanine and glutamine
- C. Glycine and Glutamine
- D. Arginine and glutamine

ANSWER: A

176. The following compound is present in RNA but absent from DNA.

- A. thymine
- B. Cytosine
- C. Uracil
- D. Guanine

ANSWER: C

177. Nucleic acids can be detected by means of their absorption maxima near 260 millimicrons. Their absorption in this range is due to \_\_\_\_\_

- A. Proteins
- B. purines and pyrimidines
- C. ribose
- D. Deoxyribose

ANSWER: B

178. Which of the following contains a deoxy sugar

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

ANSWER: A

179. In addition to the DNA of nucleus there is DNA in \_\_\_\_\_

- A. mitochondria
- B. endoplasmic reticulum
- C. golgi apparatus
- D. plasma membrane

ANSWER: A

180. The mitochondrial DNA is \_\_\_\_\_

- A. like the nuclear DNA.
- B. ss, linear
- C. ds, circular
- D. ss, circular

ANSWER: C

181. A synthetic RNA having the sequence of UUUUU will give a protein having poly \_\_\_\_\_

- A. alanine
- B. phenyl alanine
- C. glycine
- D. methionine

ANSWER: C

182. Lac operon of E. coli contains \_\_\_\_\_ in continuity

- A. regulator and operator genes only
- B. operator and structural genes only
- C. regulator and structural genes only
- D. regulator, operator and structural genes

ANSWER: D

183. A mRNA of eukaryotes can code for \_\_\_\_\_ polypeptide

- A. one
- B. two
- C. three
- D. five

ANSWER: A

184. RNA synthesis require \_\_\_\_\_

- A. RNA primer
- B. RNA template
- C. DNA template
- D. DNA primer

ANSWER: C

185. mRNA ready for protein synthesis has the \_\_\_\_\_ cap

- A. GTP
- B. ATP
- C. CTP
- D. UTP

ANSWER: A

186. The codon for phenyl alanine is \_\_\_\_\_

- A. AAA
- B. CCC
- C. GGG
- D. UUU

ANSWER: D

187. The blue print for genetic information resides in \_\_\_\_\_

- A. mRNA
- B. tRNA
- C. rRNA
- D. DNA

ANSWER: D

188. Genes are \_\_\_\_\_

- A. DNA
- B. RNA
- C. lipoproteins
- D. chromoproteins

ANSWER: A

189. Lac operon of E. coli contains \_\_\_\_\_ in continuity

- A. regulator and operator genes only
- B. operator and structural genes only
- C. regulator and structural genes only
- D. regulator, operator and structural genes

ANSWER: D

190. A mRNA of eukaryotes can code for \_\_\_\_\_ polypeptide

- A. only one
- B. two
- C. Three
- D. Five

ANSWER: A

191. RNA synthesis require

- A. RNA primer

- B. RNA template
- C. DNA template
- D. DNA primer

ANSWER: C

192. mRNA ready for protein synthesis has the \_\_\_\_\_ cap

- A. GTP
- B. ATP
- C. CTP
- D. UTP

ANSWER: A

193. Telomerase does which of the following? .

- A. Joins okazaki fragments on lagging strand
- B. Catalyzing DNA replication at the end's of the chromosome
- C. Enhances transcription
- D. Requires dCTP

ANSWER: B

194. How many hydrogen bonds form between U and A in a Watson -Crick base pair interactions?

- A. 0
- B. 1
- C. 2
- D. 3

ANSWER: C

195. Genes are \_\_\_\_\_

- A. DNA
- B. RNA
- C. lipoproteins
- D. chromoproteins

ANSWER: A

196. Codons are in

- A. DNA
- B. mRNA
- C. tRNA
- D. rRNA

ANSWER: B

197. The genetic code operates via

- A. the protein moiety of DNA
- B. the base sequence of DNA
- C. the nucleotide sequence of mRNA
- D. the base sequence of tRNA

ANSWER: C

198. Triple repeat sequence disease occurs in

- A. Alzheimer's disease
- B. Cystic fibrosis
- C. Ataxia telangectasia
- D. Huntington's chorea

ANSWER: D

199. The CCA at 3' end of tRNA is \_\_\_\_\_

- A. the anticodon stem
- B. amino acid attachment site
- C. DHU loop

D. T stem

ANSWER: B

200. In the Wobble pairing, Wobble position is in \_\_\_\_\_

- A. the 3rd base of the codon
- B. the 1st base of the codon
- C. unusual base
- D. the whole of anticodon

ANSWER: A

201. The nucleosomes contains \_\_\_\_\_

- A. acidic proteins
- B. 200 base pairs of DNA
- C. 80 base pairs of DNA
- D. non histone proteins

ANSWER: A

202. Which enzyme is used to synthesize a short RNA for initiation of DNA?

- A. Helicase
- B. Primase
- C. DNA ligase
- D. Exonuclease

ANSWER: B

203. DNA methylation is associated with:

- A. CpG islands
- B. CAT box
- C. TATA box
- D. Increasing gene transcription

ANSWER: A

204. The proteins for DNA replication in E.coli associate to form \_\_\_\_\_

- A. primosome
- B. spliceosome
- C. replisome
- D. autosome

ANSWER: C

205. Precursor for mRNA are called as \_\_\_\_\_

- A. leader sequences
- B. splicing RNA
- C. small nuclear RNA
- D. heterogenous RNA

ANSWER: D

206. Binding of holoenzyme to promoters involved local melting of DNA to form \_\_\_\_\_

- A. open promoter complex
- B. closed promoter complex
- C. stem and loop
- D. termination complex

ANSWER: A

207. The enzyme poly A polymerase is for \_\_\_\_\_

- A. RNA splicing
- B. addition of 3' tail
- C. addition of 5' cap
- D. all the above

ANSWER: B

208. In prokaryotes translation is terminated when \_\_\_\_\_

- A. rho protein reaches ribosomes
- B. release factors recognize stop codon
- C. methionine binds initiator
- D. sigma protein reaches stop codon

ANSWER: B

209. UV light produces the change in DNA is called as

- A. pyrimidine dimers
- B. alkylation of purines
- C. purine dimers
- D. alkylation of pyrimidines

ANSWER: A

210. Which enzyme is used to synthesize a short RNA for initiation of DNA?

- A. Helicase
- B. Primase
- C. DNA ligase
- D. Exonuclease

ANSWER: B

211. Which of the following gave proof that replication and formation of new phase is dependent on DNA & not on protein?

- A. Transformation experiment
- B. Conjugation experiment
- C. Blender experiment
- D. All the above

ANSWER: D

212. Precursor for mRNA are called as

- A. leader sequences
- B. splicing RNA
- C. small nuclear RNA
- D. heterogenous RNA

ANSWER: D

213. Binding of holoenzyme to promoters involved local melting of DNA to

- A. open promoter complex
- B. closed promoter complex
- C. stem and loop
- D. termination complex

ANSWER: B

214. In prokaryotes translation is terminated when

- A. rho protein reaches ribosomes
- B. release factors recognize stop codon
- C. methionine binds initiator
- D. sigma protein reaches stop codon

ANSWER: B

215. During elongation of a polypeptide \_\_\_\_\_

- A. an amino acyl tRNA enters P site
- B. an amino acyl tRNA synthetase acts
- C. ribosomes, tRNA and protein dissociates
- D. an amino acyl tRNA enters P site

ANSWER: D

216. Reverse transcriptase is
- A. DNA dependent RNA polymerase
  - B. RNA dependent RNA polymerase
  - C. DNA polymerase
  - D. RNA dependent DNA polymerase

ANSWER: B

217. During the initiation phase of translation in bacteria, which of the following is first to dissociate from the 30s ribosomal subunit?

- A. IF1
- B. IF2
- C. IF3
- D. GTP

ANSWER: C

218. The maximal rate of protein synthesis in bacterial cells (amino acid per second) is \_\_\_\_\_

- A. 12-15
- B. 3-4
- C. 0-5
- D. 75-100

ANSWER: A

219. Which of the following amino acid is specified by only one codon?

- A. Glutamine
- B. Tryptophan
- C. Asparagine
- D. Isoleucine

ANSWER: B

220. The drug chloramphenicol blocks the process of \_\_\_\_\_

- A. polypeptide chain elongation
- B. cell wall formation
- C. transcription
- D. polypeptide chain initiation

ANSWER: A

221. What percentage of mRNA is in most bacterial cells?

- A. Less than 5%
- B. 10-15%
- C. 35-40%
- D. 50-60%

ANSWER: D

222. An antibiotic that resembles the 3' end of a charged tRNA molecule is \_\_\_\_\_

- A. puromycin
- B. tetracycline
- C. streptomycin
- D. penicillin

ANSWER: B

223. Which amino acid residue is in abundance in histones?

- A. Arginine
- B. Aspartic acid
- C. Tryptophane
- D. Phenyl alanine

ANSWER: A

224. Which histone protein is not a part of nucleosome?

- A. H1
- B. H2a
- C. H2b
- D. H3

ANSWER: A

225. . In which form heterochromatin is present in DNA ?

- A. Looped solenoid form
- B. Naked DNA form
- C. Extended nucleosome form
- D. Solenoid form

ANSWER: D

226. An oncogene is a gene that has the potential to cause \_\_\_\_\_

- A. cancer
- B. obesity
- C. cystic fibrosis
- D. diabetes

ANSWER: A

227. Northern blotting is used for the separation of

- A. DNA
- B. mRNA
- C. Protein
- D. Protein DNA interactions

ANSWER: B

228. E. coli genomic DNA differs from a eukaryotic chromosome in that E. coli DNA \_\_\_\_\_

- A. has a single centromere
- B. has telomeres
- C. is circular
- D. does not undergo supercoiling

ANSWER: C

229. A chromosome with its centromere in the terminal end is a \_\_\_\_\_

- A. Submetacentric chromosome
- B. Metacentric chromosome
- C. Acrocentric chromosome
- D. Telocentric chromosome

ANSWER: C

230. Which of the following is true regarding RNA processing?

- A. Spliceosomes are present in organelles and nuclei
- B. Involves removal of exons
- C. Involves removal of one or more introns
- D. Occurs in prokaryotes

ANSWER: C

231. Nutritional mutants are \_\_\_\_\_

- A. Grow on minimal medium
- B. Lack an essential metabolic protein
- C. Are also called prototrophs
- D. Are the same as carbon-source mutants

ANSWER: B

232. Which of the following is not true for histones?

- A. They are rich in basic amino acids
- B. They are associated with the nucleosome

- C. H1, H2, H3 and H4 form the nucleosome core
- D. They are found in the nucleus

ANSWER: A

233. Which one of the following is not a type of RNA?

- A. nRNA (nuclear RNA)
- B. mRNA (messenger RNA)
- C. rRNA (ribosomal RNA)
- D. tRNA (transfer RNA)

ANSWER: A

234. If an mRNA codon reads UAC, its complementary anticodon will be \_\_\_\_\_

- A. TUC
- B. ATG
- C. AUG
- D. CAG

ANSWER: C

235. Choose the nucleoside analogue used as an anti cancer drug out of the following

- A. Methotrexate
- B. 6 - mercaptopurine
- C. Vinblastin
- D. Cytosine arabinoside

ANSWER: D

236. Which of the following statements is correct about prokaryotic gene expression?

- A. Prokaryotic mRNAs must have introns spliced out
- B. Prokaryotic mRNAs are often translated before transcription is complete
- C. Prokaryotic mRNAs contain the transcript of only one gene
- D. All of these statements are correct

ANSWER: B

237. In what way is eukaryotic transcription more complex than prokaryotic transcription?

- A. Eukaryotes have three different RNA polymerases, whereas prokaryotes only have one RNA polymerase
- B. Eukaryotic transcription initiation is much more complex than prokaryotic initiation because of the various transcription factors involved
- C. Upstream elements are required for efficient transcription in eukaryotic cells, but these elements are not usually necessary in prokaryotes
- D. All of the above statements outline ways that eukaryotic transcription is more complex

ANSWER: D

238. Which of the following DNA structure modifications are used to regulate transcription?

- A. acetylation/Deacetylation of the histone tails
- B. chromatin condensation
- C. methylation of specific bases in the DNA sequence
- D. All of the above are important modifications for transcription regulation

ANSWER: D

239. What feature about eukaryotic transcription factors is useful to biotechnology research?

- A. They have two domains, both of which bind to DNA
- B. They have two domains, both of which bind to separate proteins
- C. They have two domains: one domain binds DNA and the other binds to some part of the transcription apparatus
- D. They have only one domain that binds to RNA polymerase

ANSWER: C

240. The physical expression of genetic information in an organism is called its \_\_\_\_\_

- A. phenotype
- B. genotype
- C. trait indicator
- D. protein display

ANSWER: A

241. Polygenic traits are those determined by \_\_\_\_\_

- A. non-nuclear DNA
- B. sex
- C. more than one gene
- D. only one gene

ANSWER: C

242. Mapping chromosomes reveals \_\_\_\_\_

- A. genetic abnormalities
- B. their location in the cell nucleus
- C. what kind of cell is being examined
- D. where specific genes are located

ANSWER: D

243. The centromere \_\_\_\_\_

- A. unzips DNA molecules
- B. appears between two daughter cells during binary fission
- C. determines the location of the nucleus in a cell
- D. divides chromosomes into two arms of varying lengths

ANSWER: D

244. Genes that are found on the same chromosome are said to be \_\_\_\_\_

- A. linked
- B. bound
- C. intertwined
- D. bipolar

ANSWER: A

245. DNA can be read as a code for producing a chain of \_\_\_\_\_

- A. cells
- B. sugars
- C. amino acids
- D. salts

ANSWER: C

246. A codon is \_\_\_\_\_

- A. one three-letter "word" in the genetic code
- B. a protein cap on the end of a chromosome
- C. the enzyme that makes DNA replication possible
- D. a special kind of RNA that provides energy for cell fission

ANSWER: A

247. Repressor molecules bind to \_\_\_\_\_

- A. Promoter
- B. Enhancer
- C. Operator
- D. Hormone response element

ANSWER: C

248. Which of the following mRNA's lack poly A tail?

- A. Ferritin
- B. Interferon

- C. Insulin
  - D. None of the above
- ANSWER: B

249. Which of the following is a required substrate for the purine biosynthesis

- A. 5 - methyl thymidine
  - B. Ribose phosphate
  - C. Ara C
  - D. PRPP (5- phosphoribosylpyrophosphate)
- ANSWER: D

250. DNA is replicated \_\_\_\_\_

- A. Conservatively
  - B. Distributively
  - C. semiconservatively
  - D. Dispersively
- ANSWER: C

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