BIOLOGY

BOOKS - MODERN PUBLICATION

MOLECULAR BASIS OF INHERITANCE

Exercise

1. Out of 64 codons , 61 codons code for 20 types of amino acids , it is called :

A. Degeneracy

B. Non-ambiguous

C. Redundancy

D. Overlapping

Answer: A

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2. Repressor protein is produced by

A. Regulator gene

B. Operator gene

C. Structural gene

D. Promotor gene

Answer: A

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3. The portion of DNA which contains information for an entire polypeptide is called :

A. Muton

B. Codon

C. Operon

D. Cistron

Answer: D

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4. Okazaki fragments are associated with which phenomenon ?

A. Translation

B. Replication of DNA

C. Transcription

D. Reverse transcription

Answer: B

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5. Fill in the blanks: Operon concept was given by _____.

A. Jacob & Monod

B. David Baltimore

C. Allec Jaffery

D. None of these

Answer: A

6. The sequence of structural gene in lac operon concept is :

A. Lac A, Lac y, Lac Z

B. Lac A, Lac Z, Lac Y

C. Lac Y, Lac Z, Lac A

D. Lac Z, Lac Y, Lac A

Answer: D

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7. During transcription RNA polymerase holoenzyme binds to a gene promoter and

assumes a saddle-like structure. What is its DNA-binding sequence?

A. AATT

B. CACC

C. TATA

D. TTAA

Answer: C

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8. The two polynucleotide chains in DNA are:

A. Discontinuous

B. Antiparallel

C. Semiconservative

D. Parallel

Answer: B

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9. A codon consists of 3 bases and there are of 4 different kinds of bases in a nucleic acid altogether.how many codons will be there?

A. 64

B. 86

C. 22

D. 60

Answer: A

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10. Transcription involves transfer of the genetic information from DNA molecule to :

A. DNA molecule

B. RNA molecule

C. Protein

D. None of these

Answer: B

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11. 2003 was celebrated as the 50th anniversary of discovery of :

A. Transposon by Barbara McClintock

B. Structure of DNA by Watson and Crick

C. Both (a) and (b)

D. None of these

Answer: B

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12. The concept of one gene one enzyme was proposed by :

A. Beadle and Tatum

B. Watson and Crick

C. Corners

D. Leeuwenhoek

Answer: A

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13. Cell/ organism carrying mutated gene is :

A. Cistron

B. Mutant

C. Muton

D. Recon

Answer: B

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14. t-RNA consisting of three unpaired bases constitute :

A. Codon

B. Anticodon

C. Clover-leaf model

D. Acceptor loop

Answer: B

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15. An enzyme which increases the rate of permeability across the membrane is :

A. Permease

B. Catalase

C. Gelatinase

D. Amylase

Answer: A

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16. Molecule into which the coded information in DNA transcribed is :

A. m-RNA

B. t-RNA

C. r-RNA

D. hn-RNA

Answer: B

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17. Nitrogeneous bases do not contain :

A. Hydrogen

B. Nitrogen

C. Carbon

D. Phosphorus

Answer: B

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18. Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acids ?

A. AUG, ACG - Start/Methionine

B. UUA, UCA- Leucine

C. GUU, GCU- Alanine

D. UAG,UGA-Stop

Answer: D

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19. Polysome is formed by:

A. A ribosome with several subunits

B. Ribosomes attached to each other in a linear arrangement

C. Several ribosome attached to a single m-RNA

D. Many ribosomes attached to a strand of endoplasmic reticulum

Answer: C

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20. In the DNA molecule:

A. the proportion of adenine in relation to thymine varies with the organism

B. there are two strands which run antiparallel-one in $5' \rightarrow 3'$ direction and other in $3' \rightarrow 5'$

C. the total amount of purine nucleotides and pyrimidine nucleotides is not always

equal

D. there are two strands which run parallel in the $5' \rightarrow 3'$

Answer: D

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21. Genetic information in a DNA molecule is coded in the

A. number of bases

B. sequence of nucleotides

C. length of DNA

D. number of nucleosides

Answer: B

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22. The sequence in m-RNA transcribed from a piece of DNA having a sequence ATTGCATCT

A. TAAATGGCC

B. UAACGUAGA

C. TAACGTAGA

D. AATTGCAGA

Answer: B

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23. A phenomenon where the third base of t-RNA at its 5 end can pair with a non-complementary base of m-RNA is called :

A. universality

B. colinearity

C. degenerency

D. wobbling

Answer: D

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24. According to Chargaff's rule, which one is correct ?

A. [A]+[T]=[G]+[C]

B. [A]+[C]=[G]+[T]

C. [A]+[G]=[T]+[C]

D. Both (a) and ©

Answer: C

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25. Meselson and stahl experiment proved

A. Dna is a genetic material

B. Central dogma

C. transformation

D. semi conversation DNA replication

Answer: D

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26. The length of DNA having 23 base pairs is :

A. 78 $\dot{A}$

B. 78.4 $\dot{A}$

C. 74.8 $\dot{A}$

D. 78.2 $\dot{A}$

Answer: D

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27. During replication of DNA , Okazaki fragments are formed in the direction of :

A. $3' \rightarrow 5'$

B. $5' \rightarrow 3'$

C. $5' \rightarrow 5'$

D. $3' \rightarrow 3'$

Answer: B

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28. RNA directs the building of proteins through a sequence of :

A. exons

B. introns

C. codons

D. anticodons

Answer: C

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29. During transcription RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle-like structure. What is its DNA-binding sequence?

A. promotor

B. regulator

C. receptor

D. enhancer

Answer: A

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30. Which one is not a non-sense codon ?

A. UAA

B. UGA

C. UCA

D. UAG

Answer: C

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31. Which of the following codons has no t - RNA ?

A. UAA

B. UAU

C. UGU

D. UGC

Answer: A

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32. Removal of introns and joining the exons in a definite order in a transcription unit is called :

A. tailing

B. transformation

C. capping

D. splicing

Answer: D

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33. Molecule of ATP is structurally similar to the molecule of :

A. DNA

B. RNA molecule

C. protein

D. AMP

Answer: B

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34. True replication of DNA is possible due to :

A. hydrogenbonding

B. phosphate backbone

C. complementary base pairing rule

D. none of the above

Answer: C

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35. A polypeptide is assembled on :

A. ribosome

B. DNA

C. RNA

D. nucleolus

Answer: A

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36. Semiconservative mode on replication of DNA was proved by :

A. Hershey and Chase

B. Griffith

C. Watson and Crick

D. Meselson and Stahl

Answer: D

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37. Which of the following is a plasmid ?

A. pBR 322

B. Bam HI

C. Sal I

D. Eco RI

Answer: A

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38. To meet the demands of the society in vitro production of a large number of plantlets in a short duration is practised in floriculture and hoticulture industry today.This is called ,

A. hybridoma technology

B. somaclonal variation

C. somatic hybridization

D. micropropagation

Answer: D

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39. Which one of the following has dual functions ? It codes for methionine and also acts as initiator codon ?

A. AUG, ACG - Start/Methionine

B. AUC

C. ACU

D. ACA

Answer: A

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40. In transcription in eukaryotes heterogeneous nuclear RNA (hnRNA) IS transcribed by

A. RNA polymerase I

B. RNA polymerase II

C. RNA polymerase III

D. All of these

Answer: B

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41. RNA polymerase II is responsible for transcription of

A. Rrna

B. hnRNA

C. Trna

D. snRNA

Answer: B

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42. What will be the correct gene expression pathway ?

A. gene-mRNA-transcription-translation-protein

B. transcription-gene-translation-mRNA-protein

C. gene-transcription-mRNA-protein

D. gene-translation-mRNA-transcription-protein

Answer: B

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43. In eukaryotic cell transcription RNA splicing and RNA capping take place inside the :

A. ribosomes

B. nucleus

C. dictyosomes

D. ER

Answer: B

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44. The $3' - 5'$ phosphodiester linkages inside a polynucleotide chain serve to join

A. one DNA strand with the other DNA strand

B. one nucleoside with another nucleoside

C. one nucleotide with another nucleotide

D. one nitrogenous base with pentose sugar

Answer: C

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45. Mobile genetic sequence are called :

A. exons

B. introns

C. cistrons

D. transposons

Answer: D

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46. How many effective codons are there for the synthesis of twenty amino acids ?

A. 64

B. 32

C. 60

D. 61

Answer: D

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47. The lac operon consists of :

A. four regulatory genes only

B. one regulatory gene and three structural genes

C. two regulatory genes and two structural genes

D. three regulatory genes and three structural genes

Answer: D

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48. Out of 64 codons , 61 codons code for 20 types of amino acids , it is called :

A. colinearity

B. comaless

C. degenerency

D. non-ambiguity

Answer: B

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49. In Hershey and chase experiments, radioactive P was used to culture bacteriophages which resulted in radioactive:

A. viral DNA

B. bacterial capsule

C. viral proteins

D. plasma membrane of bacteria

Answer: D

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50. Which one of the following triplet codons is a chain termination codon ?

A. UGU

B. AAU

C. UUG

D. UAG

Answer: B

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51. The unequivocal proof of DNA as the genetic material came from the studies on :

A. bacterium

B. fungus

C. viroid

D. bacterial virus

Answer: C

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52. The central dogma of protein synthesis is :

A. $prote \in \ \rightarrow RNA \Leftrightarrow DNA$

B. $prote \in \ \Leftrightarrow DNA \rightarrow RNA$

C. $RNA \rightarrow DNA \rightarrow prote \in$

D. $DNA \Leftrightarrow RNA \rightarrow prote \in$

Answer: A

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53. Restriction enzyme Eco RI cuts the DNA between bases G and A only when the sequence in DNA is:

A. GATATC

B. GAATTC

C. GATTCC

D. GAACTT

Answer: A

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54. The lac operon is turned on when all lactose molecules bind to

A. promotor site

B. operator site

C. mRNA

D. repressor protein

Answer: C

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55. Some amino acids are coded by more than one codon hence the code is :

A. unambiguous

B. degenerate

C. universal

D. initiator

Answer: B

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56. The codon which has dual function is :

A. UGA

B. UUU

C. AUG

D. AAA

Answer: C

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57. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of

A. t-RNA

B. hnRNA

C. mRNA

D. rRNA

Answer: A

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58. Which strain of diplococcus pneumoniae is/are virulent ?

A. Smooth

B. Rough

C. Mutant

D. Wild

Answer: A

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59. The phenomenon discovered by griffith that proves DNA as genetic material is :

A. Transcription

B. Translation

C. Transformation

D. Transduction

Answer: C

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60. Which is not associated with DNA ?

A. Nucleosome

B. Spliceosome

C. Replosome

D. Chromosome

Answer: B

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61. Proteins are synthesized in the process:

A. Translocation

B. Transcription

C. Translation

D. Transformation

Answer: C

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62. Which one is codes for amino acids ?

A. Cistron

B. Exon

C. Intron

D. Codon

Answer: D

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63. Lactose in lac operon acts as :

A. Repressor

B. Inducer

C. Co-repressor

D. Co-inducer

Answer: B

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64. Termination codon is :

A. AUG

B. UGA

C. AAU

D. AUA

Answer: A

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65. 61 codons code for 20 amino acids because of the property :

A. Non-overlapping

B. Comaless

C. Degeneracy

D. Wobbling

Answer: C

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66. How many ribosomes are required for translation of one molecule of protein ?

A. One

B. Two

C. As many codons

D. Many

Answer: A

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67. Intron part of DNA codes for :

A. Carbohydrate

B. Lipid

C. Polypeptide

D. None

Answer: D

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68. A nonsense codon is :

A. UAG

B. UAA

C. Both (a) and (b)

D. UUU

Answer: C

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69. Fill in the blank: The gene which synthesizes a repressor protein is _____.

A. Regulator gene

B. Operator gene

C. Promoter gene

D. Structural gene

Answer: A

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70. Which RNA carries the genetic message from nucleus to ribosome ?

A. tRNA

B. mRNA

C. rRna

D. sRNA

Answer: B

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71. Transcription is the formation of

A. mrna

B. PNA

C. prion

D. protein

Answer: A

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72. Genetic code is :

A. Singlet

B. Triplet

C. Doublet

D. None of the above

Answer: C

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73. In DNA molecule ,the sugars

A. Bond to both phosphate groups and nitrogenous bases by covalent bonds

B. Bond to nitrogenous bases by hydrogen bond

C. Bond covalently to nitrogenous bases

D. Bond covalently to phosphate groups

Answer: A

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74. The peptide bonds are present between :

A. Nucleic acids

B. Organic acids

C. Fatty acids

D. Amino acids

Answer: D

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75. UAA , UAC and UGA are:

A. Starting codons

B. Non-overlapping codons

C. Non-sense codons

D. Degenerate codons

Answer: C

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76. Which of the RNA is smallest and used in feeding of amino acid to a ribosome ?

A. hnRNA

B. trns

C. mRNA

D. rRNA

Answer: B

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77. After reaching the cytoplasm the mRNA attaches itself to :

A. 40 S particle of ribosome

B. 60 S particle of ribosome

C. 70 S ribosome

D. Endoplasmic reticulum

Answer: A

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78. The process by which DNA of nucleus passes information to RNA is called :

A. Translocation

B. Transcription

C. Translation

D. Transduction

Answer: B

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79. Gene was synthesized in vitro by :

A. Khorana

B. Ochoa

C. Hollay

D. Nirenberg

Answer: A

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80. DR. Hargobind khurana has been awarded Nobel prize for research on :

A. Oral contraceptives

B. Hormones

C. Genetic code

D. Immunology

Answer: C

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81. The minimum length of cistron in base pairs which synthesises a polypeptide of 50 amino acids is :

A. 50 bp

B. 100 bp

C. 150 bp

D. 200 bp

Answer: C

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82. Genes that are involved in turning on or off the transcription of structural genes are called :

A. Polymorphic genes

B. Operator genes

C. Redundant genes

D. Regulatory genes

Answer: B

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83. The lac operon is turned on when all lactose molecules bind to

A. Operator gene

B. Repressor protein

C. Promoter gene

D. m-RNA

Answer: B

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84. Tryptophan operon is :

A. Repressible system

B. Inducible system

C. Controlled by regulatory gene

D. Made up of three structural genes

Answer: A

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85. Regulated unit of genetic material is called

:

A. Operator gene

B. Regulatory gene

C. Operon

D. Promoter gene

Answer: C

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86. Initiation codon is :

A. AUG

B. AGU

C. AAU

D. AUA

Answer: A

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87. The sequence of genes In lac operon in E. coli are :

A. Promotor-operator-structural genes

B. Operator-promoter-structural-genes

C. Structural gene-operator-promoter

D. Structural gene-promoter-operator

Answer: A

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88. Which of the following statements about genetic code is correct ?

A. It is triplet, universal, ambiguous and degenerate.

B. It is triplet, universal, non-ambiguous and degenerate.

C. It is triplet, universal, ambiguous and non-degenerate.

D. It is triplet, universal, non-ambiguous and non-degenerate.

Answer: B

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89. The binding sites tRNA and amino acid respectively are :

A. mRNA with DHU loop and amino acid with CCA end

B. mRNA with CCA end and amino acid with anti-codon

C. mRNA with anti-codon loop and amino acid with CCA end

D. mRNA with anti-codon loop and amino acid with DHU loop

Answer: C

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90. A bacteriophage with radioactive DNA and protein when infects a bacterium the

radioactivity inside the bacterium will be located :

A. in DNA

B. in protein

C. both DNA and protein

D. in all parts of bacterial cell

Answer: A

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91. The triplet UUU codes for :

A. Leucine

B. Methionine

C. Phenylalanine

D. Glycine

Answer: C

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92. The term ecosystem was proposed by Odum

A. Hershey and Chase

B. Khorana and Nirenberg

C. Kornberg and Ochoa

D. Beadle and Tatum

Answer: D

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93. The term gene was coined by _____

A. Mendel

B. Johnannsen

C. Morgan

D. Bateson

Answer: B

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94. Recipient of Nobel prize for DNA double helical :

A. Watson and Crick

B. Khorana and Nirenberg

C. Kornberg and Ochoa

D. Beadle and Tatum

Answer: A

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95. mRNA is synthesized over DNA double in the direction

A. $5' \rightarrow 3'$

B. $3' \rightarrow 5'$

C. Both a and b

D. Depends on DNA strand

Answer: A

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96. Okazaki fragments are :

A. RNA primers

B. Short DNA fragments on lagging strand

C. Short DNA fragments on leading strand

D. DNA fragments from radiation

Answer: B

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97. Which one is codes for amino acids ?

A. Cistron

B. Exon

C. Intron

D. Codon

Answer: D

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98. Wobble hypothesis was given by :

A. Holly

B. Nirenberg

C. Khorana

D. Crick

Answer: D

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99. In genetic code dictionary codons used to code for all the 20 essential amino acids are :

A. 20

B. 60

C. 61

D. 64

Answer: C

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100. Which of the following inhibits protein synthesis bu binding to 50S ribosomes ?

A. Tetracyclin

B. Streptomycin

C. Erythromycin

D. Penicillin

Answer: C

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101. Initiating codon in prokaryote is :

A. AGU

B. AAU

C. AUG

D. AUA

Answer: C

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102. Termination codon which stops further addition of amino acids to the polypeptide chain is :

A. AAU

B. GUG

C. AUG

D. UAG

Answer: D

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103. Gene which is responsible for the synthesis of a polypeptide chain is called :

A. Operator gene

B. Regulatory gene

C. Promoter gene

D. Structural gene

Answer: D

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104. In the operon system , the repressor protein can bind only with the :

A. Structural gene

B. Regulatory gene

C. Operator gene

D. Promoter gene

Answer: C

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105. All the termination codons begin with the nucleotide of :

A. Adenine

B. Uracil

C. Guanine

D. Cytosine

Answer: B

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106. Nitrogenous bases do not contain :

A. Hydrogen

B. Nitrogen

C. Carbon

D. Phosphorus

Answer: D

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107. write short notes on the following - Structure of lac operon

A. an operator

B. Structural genes

C. an enhancer

D. a promoter

Answer: C

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108. Describe the semiconservative model of DNA replication

A. fungus

B. bacterium

C. plant

D. virus

Answer: B

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