BIOLOGY

BOOKS - MBD -HARYANA BOARD

MOLECULAR BASIS OF INHERITANCE

Example

1. Group the following as nitrogenous bases and nucleosides:

Adenine, Cytidine, Thymine, Guanosine, Uracil and Cytosine.

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2. If a double stranded DNA has 20% of cytosines, calculate the percent of adenine in the DNA.

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3. If the sequence of one strand of DNA is written as follows:

`5' A T G C A T G C A T G C A T G C A T G C A T G C -3' Write down the sequence of complementary strand in 5' and 3' direction.

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4. Which property of DNA double helix led Watson and Crick to hypothesise

semiconservative mode of DNA replication? Explain.

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5. Depending upon chemical nature of template (DNA or RNA) and the nature of nucleic acids synthesized from it (DNA or RNA), list the types of nucleic acid polymerases.

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6. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material?

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7. Differentiate between the following:

Repetitive DNA and satellite DNA

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8. Differentiate between the following:

mRNA and tRNA

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9. Differentiate between the following:

Template strand and coding strand.

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10. List two essential roles of ribosome during translation.

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11. In the medium where E. coli was growing, lactose was added, which induced the lac operon. Then, why does lac operon shut down some time after addition of lactose in the medium?

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12. Explain (in one or two lines) the function of following:

Promoter

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13. Explain (in one or two lines) the function of following:

tRNA

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14. Explain (in one or two lines) the function of following:

Exons.

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15. Why is the Human Genome project called a mega project?

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16. What is DNA fingerprinting? Mention its application.

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17. Briefly describe the following :

Transcription

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18. Briefly describe the following :

Polymorphism

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19. Briefly describe the following :

Translation

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20. Briefly describe the following :

Bionformatics.

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21. Name the genetic material for mjority of organisms.

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23. How many nucleotides are present in a bacteriophage $\phi \times 174$?

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24. List the number of base pairs in :

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40. Name three kinds of polymerases.

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41. What is splicing?

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42. How does development and differentiation of embryo take place to form adult at molecular level?

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43. Expand UTR.

Watch Video Solution

44. Where are UTRs present in mRNA strand?

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45. Write significance of UTRs.

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46. Name any two non-sense codon.

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47. Name the initiation codons.

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48. What are the exceptions to the general rule that DNA is the genetic material in all organisms?Give evidences that support these exceptions.

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49. What do you mean by a term 'replication fork'?

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50. During DNA replication used for $5', 3'$ strand and newly formed strand $3 - 5$ strand?

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51. In which type of pathway repressible operon system operate?

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52. What is cistron?

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109. List the characteristics of DNA molecule.

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110. Discuss the process of translation in detail.

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197. RNA was first gentic material ,DNA evolved later on.Explain.

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201. What is RNA polymerase?Write its functions.

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202. Suppose during transcription of DNA code AAA,a mistake occurs due to which UUG code of RNA is formed .Due to this what change in picking the type of amino acid would occur during synthesis of protein?

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Exercise

1. Fill in the blanks with suitable words:

..... is the technique by which the three - dimensional structures of macromolecules can be studied .

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2. Fill in the blanks with suitable words:

The DNA molecule takes a complete turn after every ..... base pairs.

Watch Video Solution

3. Fill in the blanks with suitable words:

The experiment on DNA using ^{15}N isotope proved that its replication is ..... .

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4. Fill in the blanks with suitable words:

..... are enzymes that unwind DNA helices while ..... break and reseal the strands.

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5. Fill in the blanks with suitable words:

A sequence of three nitrogen bases that code for an amino-acid is a ..... .

Watch Video Solution

6. State true or false:

Transfer RNA is present in the cytoplasm and help in bringing activated amino acids to ribosomes.

Watch Video Solution

7. State true or false:

The hydrolysis of GTP provides energy during initiation,elongation and termination of peptide chain.

Watch Video Solution

8. UAA, GAG, UGA and AUG are non-sense codon and signal the termination of

polypeptide chain.

Watch Video Solution

9. State true or false:

Leading strand is a replicated strand of DNA which grows continously without any gap in $5' \rightarrow 3$ direction.

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10. State true or false:

The ratio of $A + t / g + C$ is constant for a species.Restriction enzymes will cut only at a specific DNA sequence.

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11. State true or false:

Termination codon is present on mRNA.

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12. Coin one word for the following statements:

Protein coat of virus .

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13. Coin one word for the following statements:

Synthesis of 3 nitrogen bases on mRNA which stand for one amino acid .

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14. Coin one word for the following statements:

Fragments of DNA synthesised the lagging strand.

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15. Khorana first deciphered the triplet codons of

A. Serine and sioleucine

B. Cysteine and valine

C. Tyrosine and tryptophan

D. Phenylalanine and methionine.

Answer:

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16. Experimental material in the study of DNA replication has been

A. Escherichia coli

B. Neurospora crassa

C. Pneumococcus

D. Drosophila melangogaster

Answer:

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17. Nucleotide arrangement in DNA can be seen by

A. X-ray crystallography

B. Electron microscope

C. Ultracentrifuge

D. Light microscope.

Answer:

Watch Video Solution

18. Pneumococcus experiement proved that:

A. Bacteria do not reproduce asexually

B. Bacteria undergo binary

C. DNA is genetic material

D. RNA may sometimes coontrol production of DNA and proteins .

Answer:

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19. The process of translation is:

A. Ribosome synthesis

B. Protein synthesis

C. DNA synthesis

D. RNA synthesis.

Answer:

Watch Video Solution

20. During trnascription ,the DNA site at which RNA polymerase binds,is called:

A. Regulator

B. Receptor

C. Enhancer

D. Promoter.

Answer:

Watch Video Solution

21. During transcription,if nucleotide sequence f DNA strand,that is being coded is ATACG,then the nucleotide sequence in m-RNA would be:

A. RATGC

B. TATGC

C. TCTGG

D. UAUGC.

Answer:

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22. During the replication of a bacteria chromosome,DNA synthesis starts from the replication origin site and:

A. Moves in bi-directional way

B. RNA primers are involved

C. Is facilitated by telomerase

D. Moves is one direction of site.

Answer:

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23. In the genetic code dictionary ,how many codons are used to code for all the 20 essential amino acids?

A. 64

B. 61

C. 60

D. 20

Answer:

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24. Which one of the following triplet codes, is correctly matched with its specificity for an

amino acid in protein synthesis or as 'start' or 'stop' codon ?

A. UUU-Stop

B. UGU-Leucine

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