BIOLOGY

BOOKS - SRIJAN BIOLOGY (ENGLISH)

MOLECULAR BASIS OF INHERITANCE

Illustrative Questions

1. Which of the following nucleotide compositions will be possible, if DNA is double stranded?

A. Only G and T

B. Only C and T

C. Only A and T

D. Only A and G

Answer: C

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2. Give reason, why RNA viruses are the most mutable and evolve faster than other viruses.

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3. Consider the short message: AUG GCA Answer the following questions, assuming first that the code is

overlapping and then it is non-overlapping

How many codons would represented in this oligonucleotide?

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4. Consider the short message: AUG GCA Answer the following questions, assuming first that the code is overlapping and then it is non-overlapping

If the second G was changed to a C, how many codons would be changed?

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5.

3-TACCGATCCGAGCTG-5

Draw its complementary chain.

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6.

3-TACCGATCCGAGCTG-5

Construct the RNA molecule, which will be transcribed.

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7. Given below is the sequence of processed mRNA ready for translation:

5-AUG CUA UAC CCU CUU UAU CUG AGA-3'

How many amino acid residues will make the up polypeptide corresponding to this mRNA?

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8. Given below is the sequence of processed mRNA ready for translation:

5-AUG CUA UAC CCU CUU UAU CUG AGA-3'

How many different tRNA molecules would be necessary to translate this mRNA?

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9. All the cells in a multicellular organism have same genetic material yet they function differently. Explain how?

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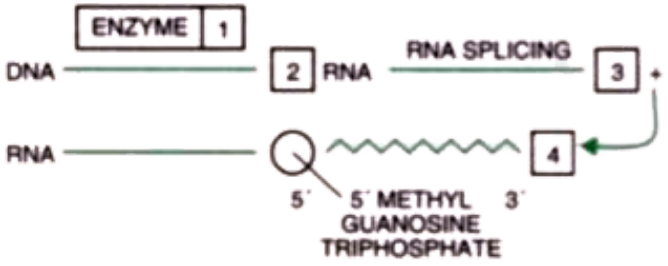
10. Given below is a sequence of steps of transcription in a eukaryotic cell. Fill up the blanks (1, 2, 3, 4) left in the sequence.



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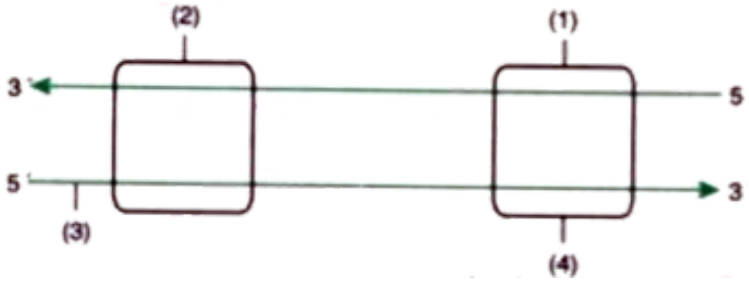
11. In the following diagram the two DNA strands represented are ready for transcription.

Label the parts marked 1 to 4 and state their functions in transcription.



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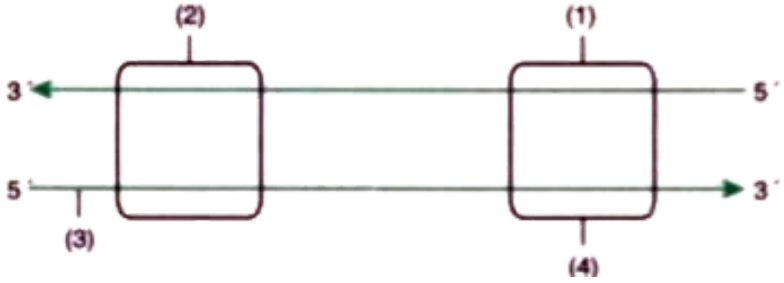
12. In the following diagram the two DNA strands represented are ready for transcription.

Which one of the two strands of DNA has nucleotide sequence similar to mRNA that will be transcribed and why?



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13.

Look at the above sequence and mention the events A, B and C

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14. What does central dogma state in molecular biology? How does it differ in some viruses?

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15. Identify giving reasons, the salient features of genetic code by studying the following nucleotide sequence of mRNA strand and the polypeptide chain translated from it. AUG UUU UCU UUU UUU UCU UAG Met- Phe- Ser- Phe- Phe- Ser.

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16. Which property of DNA double helix led hypothesise DNA Watson and Crick to semiconservative mode of replication? Explain.

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17. The two main differences between RNA and DNA are

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18. You are repeating the Hershey-Chase experiment and are provided with two isotopes: 32P and 15N (in place of 35S in the original experiment). How do you expect your results to be different?

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19. There is only one possible sequence of amino acids when deduced froma given nucleotides. But multiple nucleotides sequence can be deduced from a single amino acid sequence. Explain this phenomena.

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20. A low level of expression of lac operon occurs at all the time. Can you explain the logic behind this phenomena.

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21. Would it be appropriate to use DNA probes such as VNTR in DNA fingerprinting of a bacteriophage?

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22. Do you think that the alternate splicing of exons may enable a structural gene to code for several isoproteins from one and the same gene? If yes, how? If not, why so?

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23. Comment on the utility of variability in number of tandem repeats during DNA finger printing.

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24. During the course of evolution why was DNA was chosen over RNA as genetic material? Give reasons by first discussing the desired criteria in a molecule that can act as genetic material and in the light of biochemical differences between DNA and RNA.

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25. What is the role of introns in eukaryotic genome?

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26. Who first proposed semiconservative replication of DNA?

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27. Which organisms were used in Hershey-chase experiment?

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28. Name the techniques used for separation of ink

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29. What were the results of first, second and third generations?

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30. A primer comprising 5 bases is required to allow copying of the following single-stranded DNA sequence 5-ATGCCTAGGTC ...3'

Name the appropriate primer that should start DNA replication.

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31. If the sequence of the coding strand in a transcription unit is as follows:

5-ATGCCTAGGTCCAGGCAT-3

Write down the sequence of mRNA. Write down the anticodon for each code and their corresponding amino acids

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32. What do you understand by 5' end and 3 end?

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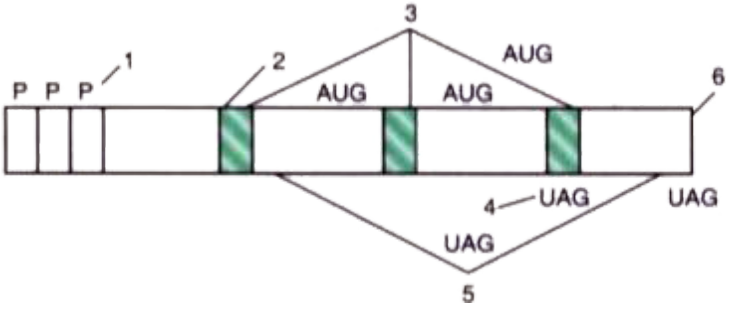
33. Label the diagram . 1, 2, 3, 4, 5 and 6



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34. State whether the diagram is of prokaryotes or eukaryotes.

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35. Name three unusual bases present in tRNA and name the bases from which these are developed.

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36. How many histones make the core part of a nucleosome? What is the basis of binding DNA molecule to the histones?

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37. Write the principle involved in the separation of DNA fragments by gel electrophoresis

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38. Calculate the total number of thymine bases present in the double-stranded DNA if it transcribes an mRNA which reads as follows:

5-AUGCAUCAUGCAAUCAGG-3

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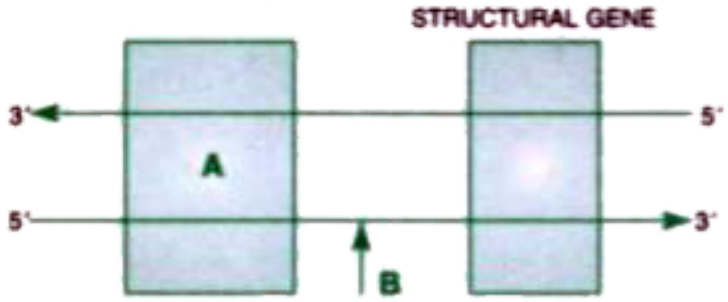
39. Name the parts A and B of the transcription unit in the given picture.



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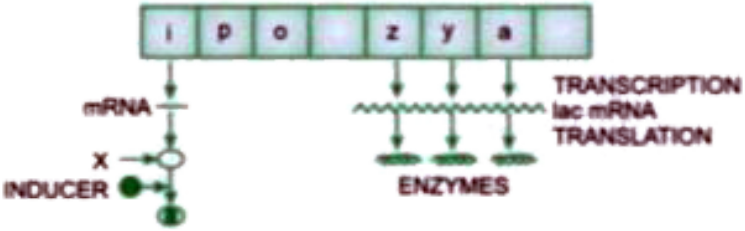
40. Study the given figure and answer the questions:

Name the molecule X' synthesised by i' gene. How does

this molecule get inactivated?



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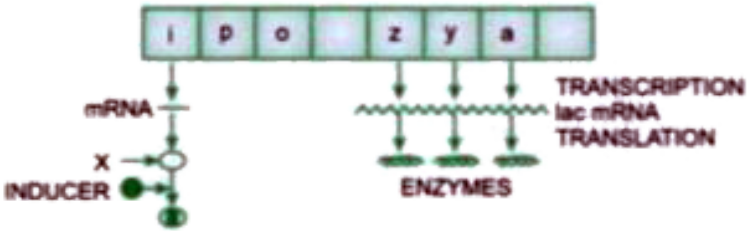
41. Study the given figure and answer the questions:

Name the enzyme transcribed by the gene Z.



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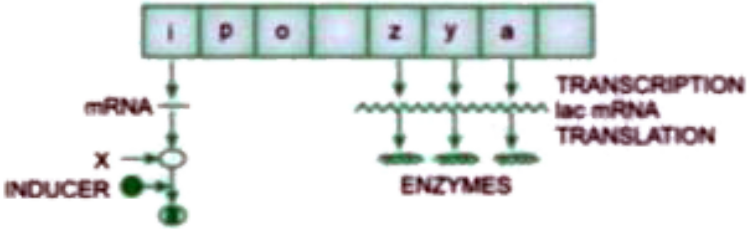
42. Study the given figure and answer the questions:

Name the enzyme transcribed by the gene Z.



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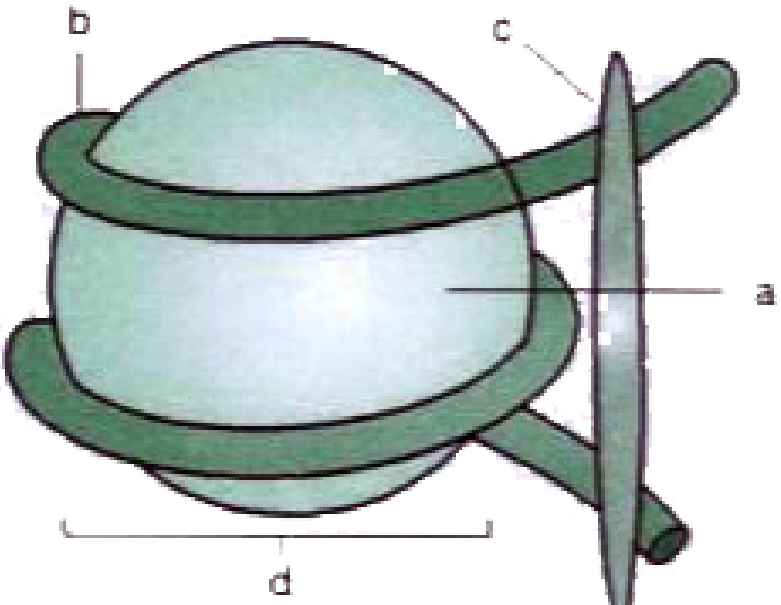

43.

What is this diagram representing?

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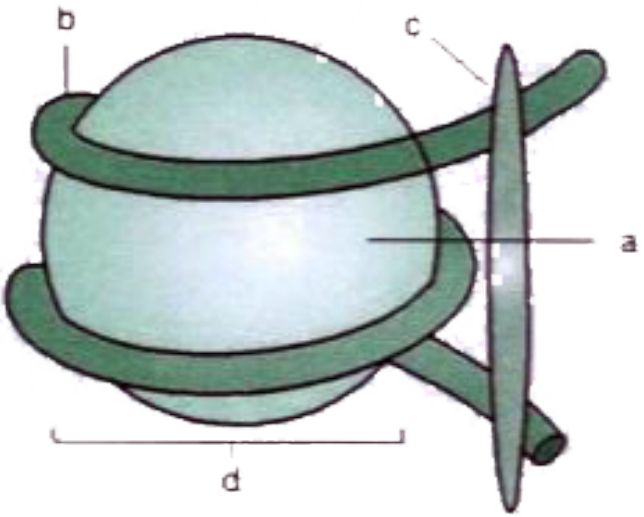

44.

Name the parts a, b, c and d.

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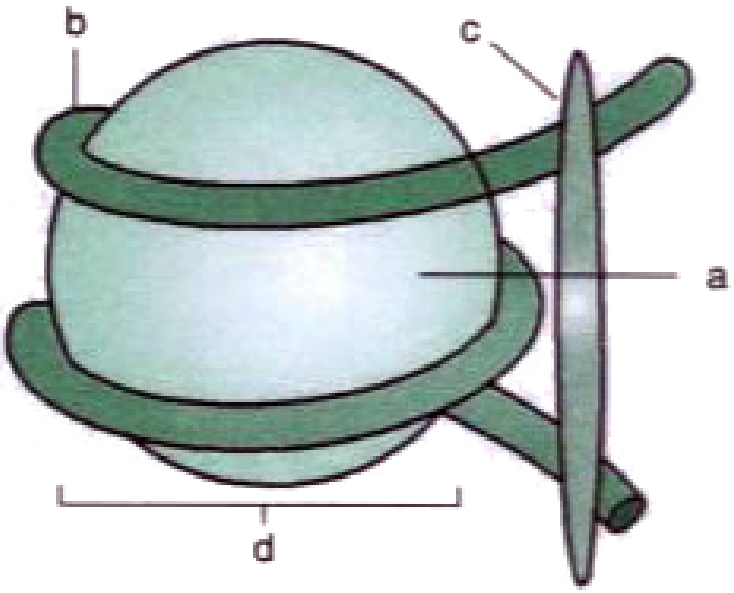

45.

In the eukaryotes the DNA molecules are organised within the nucleus. How is the DNA molecule organised in a bacterial cell in absence of a nucleus?

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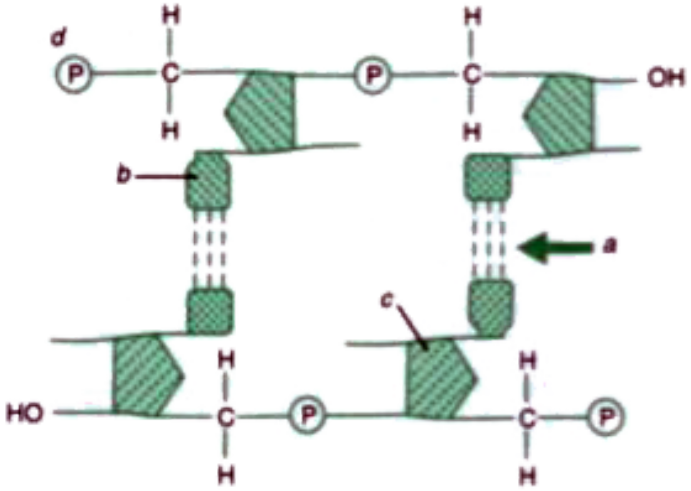
46. Study the given portion of double-stranded polynucleotide chain carefully. Identify a, b, c and d.



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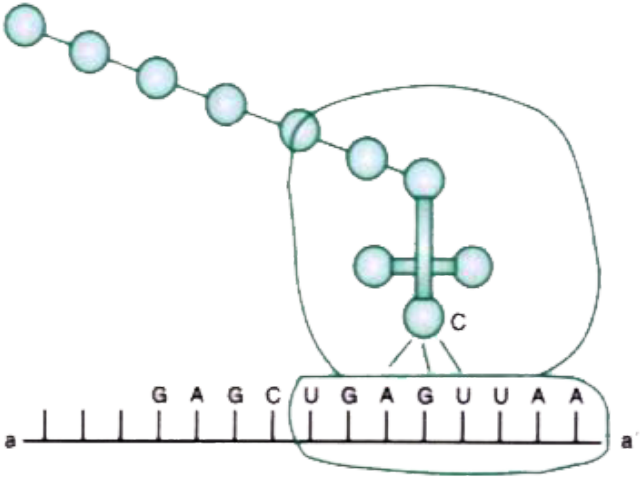
47. Identify the polarity from a to a', in the given diagram and mention how many amino acids are

expected to be added to this polypeptide chain.



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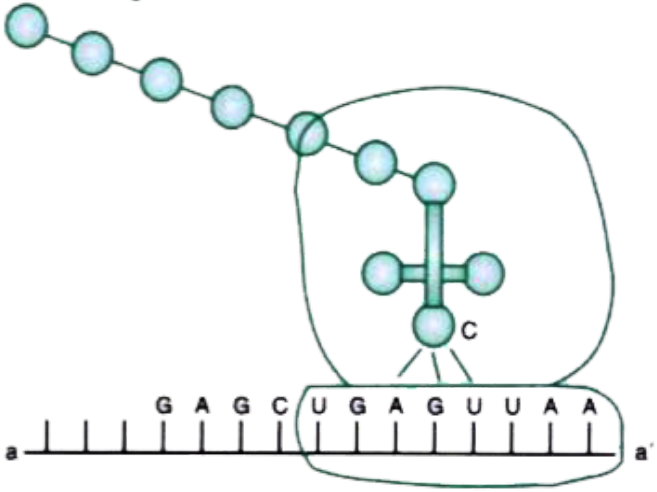
48. Mention the DNA sequence coding for serine and the anticodon of tRNA for the same amino acid.



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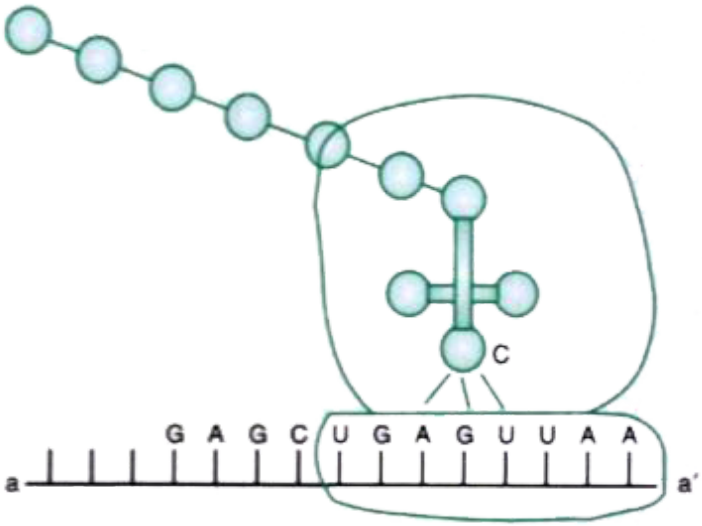
49. Why are some untranslated sequence of bases seen in mRNA, coding for polypeptide? Where exactly

are they present on mRNA?



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50. Define transcription unit

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51. Correct, if false, by changing only the bold words: bDuring splicing exons are removed and introns are joined together.

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Practice Questions Very Short Answer Type Questions

1. Name the organism in which RNA serves as a genetic material.

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2. When does DNA replicate in cell cycle of eukaryotes?

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3. Who first identified DNA and what was the name given to it?

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4. Which enzyme joins the short pieces in lagging strands during DNA synthesis?

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5. What are retroviruses?

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6. How do the tRNA molecules appear in

Two dimensional, and

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7. Mention the contribution of genetic maps in human

genome project.

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8. What forms the backbone of a polynucleotide strand of a nucleic acid?

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9. Name the chromosomes having maximum and least number of genes respectively.

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10. Name the enzyme that can break and reseal the strands of DNA.

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11. What conclusion is drawn from the 'Blender experiment' performed by Hershey and Chase?

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12. In which direction is the new strand of DNA synthesised during replication?

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13. Insertion or delection of a single base causes

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14. Mention the role of the codons AUG and UGA during protein synthesis.

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15. In which direction is the leading strand synthesised during DNA synthesis?

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16. What is the base pairing pattern of DNA?

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17. Name the enzyme which can do proof reading during DNA synthesis in bacterial cells.

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18. Name the initiation codon for protein synthesis. Name the amino acid it codes for.

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19. What is the function of amino-acyl-tRNA synthetase?

Watch Video Solution

20. What is the function of ligase?

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21. Name the process in which the unwanted mRNA regions are removed and the wanted regions are joined

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22. Mention the role of DNA polymerase other than polymerising deoxyribonucleotides during DNA synthesis.

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23. What is nucleosome?

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24. Give chemical name for thymine.

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25. Name the technique used in making copies of a specific segment of DNA

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26. Due to an error during transcription, ATG of DNA formed UAG in mRNA. What would happen to the polypeptide chain during translation by this changed mRNA?

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27. While an mRNA strand is being translated in the ribosome subunit, the triplets in sequence were UAC and UAG. One of them. codes for tyrosine. What is the significance of the other? Pick out the codon and specify.

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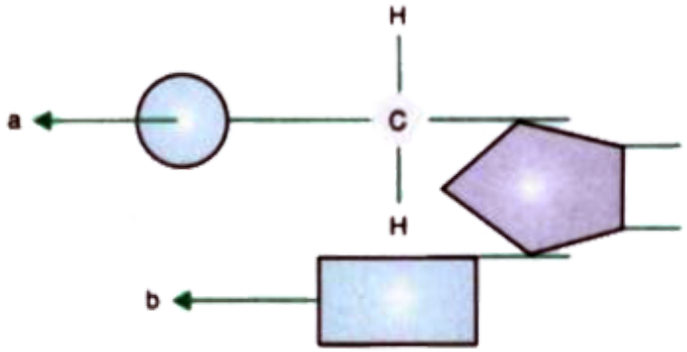
28. Name the components 'a' and 'b' in the nucleotide with a purine below



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29. Name the technique used for separating DNA fragments in the laboratory.

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30. Why hnRNA' is required to undergo splicing

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31. Mention the two addition processing which hnRNA needs to undergo after splicing so as to become

functional.

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32. Mention two functions of the codon AUG.

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33. Why is the enzyme cellulose used for isolating genetic material from plant cells but not for animal cells?

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34. How is the action of exonuclease different from that of endonuclease ?

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35. Give one word - One codon codes for only one amino acid. The genetic code is ....

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36. Name the positively charged proteins around which the negatively charged DNA is wrapped.

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37. Name the two basic amino acids that provide positive charges to histone proteins.

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Practice Questions Short Answer Type

1. If the base sequence of one strand of DNA is CATTAGTACGAC. What will be the base sequence of its complementary DNA strand

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2. If the base sequence of one strand of DNA is CATTAGTACGAC. What will be the base sequence of:

Complementary RNA strand.

Watch Video Solution

3. Differentiate between the functions of primase (RNA polymerase) and DNA polymerase

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4. What is the category of virus that carries reverse transcriptase? What is the purpose of this enzyme?

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5. What is meant by DNA $\xrightarrow{a}$ RNA $\xrightarrow{b}$ Protein?

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6. What do you understand by the antiparallel arrangement of DNA strands?

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7. Why is replication not continuous on the DNA template with `5' rarr 3' direction?

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8. Three codons on mRNA are not recognised by tRNA. What are they? What is the general term used for them? What is their significance in protein synthesis?

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9. What is splicing? Why is it necessary in eukaryotic genes?

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10. Why is it essential that tRNA binds to both an amino acid and an mRNA codon during protein synthesis?

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11. Certain molecular processes are given in column (A). Provide the terms to these processes in column (B) by selecting from the given terms: Recombination, Gene regulation, Prokaryotic _ transcription, Eukaryotic transcription, Translation, Replication, Gene transfer, |

DNA fingerprinting.

Column A	Column B
(a) DNA → DNA (b) DNA → hnRNA (c) mRNA → Protein (d) Repressor protein + Operator → No transcription	

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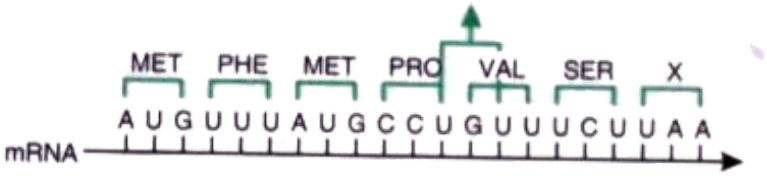
12. Read the sequence of the nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain.



Polypeptide: met-phe-met-pro-val-ser

Provide the triplet of bases (codon) for (i) valine (ii) proline.

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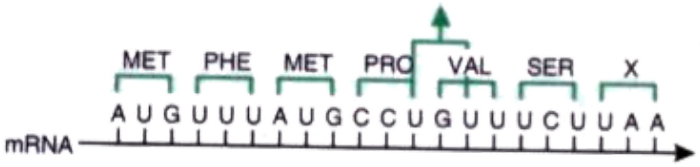
13. Read the sequence of the nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain.



Polypeptide: met-phe-met-pro-val-ser

Write the nucleotide sequence of the DNA strand from which this mRNA was transcribed.

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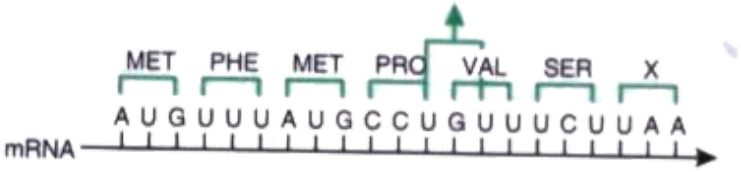
14. Read the sequence of the nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain.



Polypeptide: met-phe-met-pro-val-ser

What does the last codon of this RNA stand for?

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Practice Questions Short Answer Type Ii

1. What are introns and exons? What process remove the unwanted RNA regions and joins those that code for amino acids?

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2. What is meant by R-cells and S-cells with which Frederick Griffith carried out his experiments on Diplococcus pneumoniae? What did he prove from these experiments?

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3. A tRNA is charged with the amino acid methionine.

At which side in the ribosome will the tRNA bind?

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4. A tRNA is charged with the amino acid methionine.

Name the enzyme responsible for this binding.

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5. A tRNA is charged with the amino acid methionine.

Name the enzyme responsible for this binding.

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6. A tRNA is charged with the amino acid methionine. Give the anticodon of this tRNA.

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7. How is the synthesis of a polypeptide chain terminated? What is the role of guanosine triphosphate (GTP) in this process?

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8. Describe the steps involved in the initiation of polypeptide synthesis.

Watch Video Solution

9. List three major functions of the genes.

Watch Video Solution

10. State any two structural and one functional difference between DNA and rRNA.

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11. Name the enzyme which catalyses the peptide bond formation between amino acid during protein synthesis.

Watch Video Solution

12. Describe the steps involved in polypeptide chain elongation.

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13. Two claimant fathers filed a case against a lady claiming to be the father of her only daughter. How

could this case be settled identifying the real biological father?

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14. Write any three unusual bases present in Yeast's alanine tRNA with their sources.

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15. Describe the experiment conducted by Alfred Hershey and Martha Chase for identification of genetic material.

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16. Why is it considered path breaking in the field of Molecular Biology?

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17. Describe the process of transcription in a bacterium.

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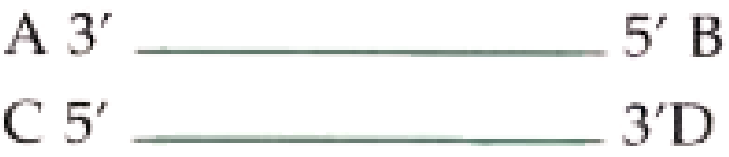
18. 

AB and CD represent two strands of a DNA molecule. When it undergoes replication, forming a replication fork between A and C:

Name the template strand for replication.

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19. 

AB and CD represent two strands of a DNA molecule. When it undergoes replication, forming a replication

fork between A and C:

Using which strand as the template, will there be continuous synthesis of a complementary DNA strand?

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20.

AB and CD represent two strands of a DNA molecule. When it undergoes replication, forming a replication fork between A and C:

Complementary to which strand will Okazaki segments get synthesised and discontinuous synthesis will occur?

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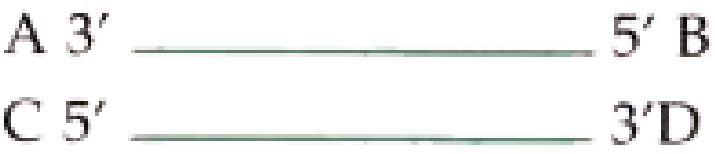
21. 

AB and CD represent two strands of a DNA molecule. When it undergoes replication, forming a replication fork between A and C:

What is template strand and Okazaki pieces?

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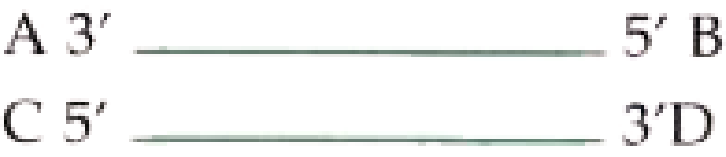
22. 

AB and CD represent two strands of a DNA molecule. When it undergoes replication, forming a replication fork between A and C:

In which direction is a new strand synthesised?

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23. Draw a neat labelled diagram of a nucleosome. Mention what enables histones to acquire a positive charge.

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24. State the role of transposons in silencing of mRNA in eukaryotic cells.

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Practice Questions Long Answer Type Questions

1. Describe the salient features of the double helical model of DNA.

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2. Explain the process of DNA replication.

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3. What is reverse transcription? Explain how single-stranded RNA of viruses give rise to double-stranded DNA?

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4. One chromosome contains one molecule of DNA. In eukaryotes the length of the DNA molecule is

enormously large. Explain how such a long molecule fits into the tiny chromosomes seen at Metaphase.

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5. (a) Explain the role of regulatory gene, operator and structural genes in lac operon when E. Coli is growing in a culture medium with the sources of energy as lactose.

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6. Genetic material is DNA and not protein. How did Griffith prove this?

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7. Give any six features of the humen genome.

Watch Video Solution

8. What are the advantages and probable risks of genetic engineering?

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9. What are retroviruses? How do they modify the central dogma in molecular biology?

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10. What are three types of RNA molecules which perform different functions?

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11. Which one of these has the shape of a clover leaf in two dimensional structure?

A. transfer RNA

B. messenger RNA

C. ribosomal RNA

D. heterogenous RNA

Answer:

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12. How is each RNA related in the information flow during protein synthesis? Explain.

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13. (a) State the arrangement of different genes that in bacteria is referred to as operon.

(b) Describe the role of lactose in lac operon.

(c) Draw a schematic labelled illustratiomof lac operon in a switched on state.

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14. (a) State the arrangement of different genes that in bacteria is referred to as operon.

(b) Describe the role of lactose in lac operon.

(c) Draw a schematic labelled illustratiomof lac operon in a switched on state.

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15. How was bacterial transformation proved experimentally? Who has performed this experiment?

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16. Who performed 'Blender experiment' with respect to DNA? What was the objective of this experiment? Explain the procedure in detail.

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17. Where do transcription and translation occur inside a living cell? Briefly describe the three steps involved in

the process of translation.

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18. Illustrated below is a DNA segment, which constitutes a gene.

Explain how do these genes express?

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19. Illustrated below is a DNA segment, which constitutes a gene.

Name the shaded and unshaded parts of the gene.

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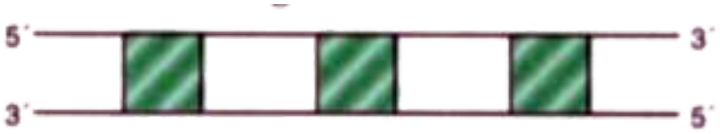
20. Illustrated below is a DNA segment, which constitutes a gene.

Explain how do these genes express?

Watch Video Solution

21. Illustrated below is a DNA segment, which constitutes a gene.



How is this gene different from prokaryotic gene in its expression?

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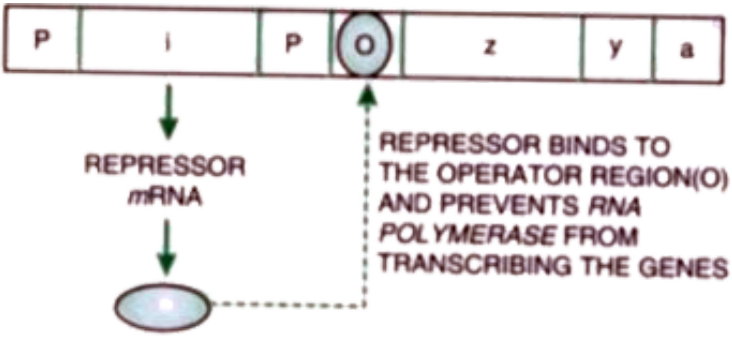
22. Look at the figure depicting lac operon of E. coli.



What could be the series of events when an inducer is present in the medium in which E. coli is growing?

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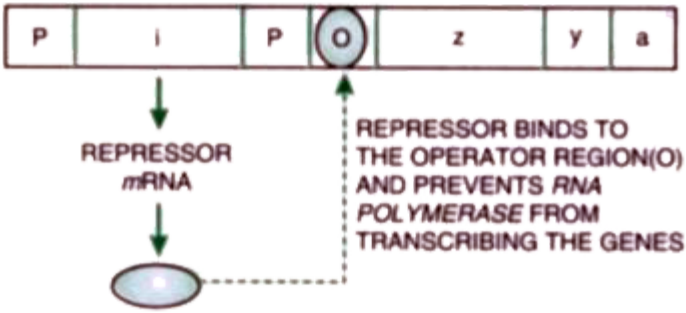
23. Look at the figure depicting lac operon of E. coli.



Name the inducer.

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24. Describe how the lac operon operates, both in the presence and absence of an inducer in E. coli.

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25. How are the structural genes inactivated / activated in lac operon in E. coli? Explain.

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Previous Years Board Paper Questions Very Short Answer Type Questions

1. Give a brief answer for

What are introns ?

Watch Video Solution

2. (a) What is Central dogma? Who proposed it?

(b) Describe Meselson and Stahl's experiment to prove that the DNA replication is tsemi-conservative.

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3. Give scientific term to the smallest unit of DNA which can mutate.

Watch Video Solution

4. What is recon?

Watch Video Solution

Previous Years Board Paper Questions Short Answer Type Ii

1. Describe the structure of a nucleosome with the help of a well-labelled diagram.

Watch Video Solution

Previous Years Board Paper Questions Long Answer Type Questions

1. Give an account of artificial chromosomes in transfer of genetic material.

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2. Explain the mechanism of transcription in a prokaryotic cell.

Watch Video Solution

3. Name the components of lac operon and discuss their role

Watch Video Solution

4. Describe post transcriptional processing of RNA in eukaryotes.

Watch Video Solution

5. Describe Avery, McLeod and McCarty's experiment. State its significance.

Watch Video Solution

Review Questions

1. Give one significant difference between each of the following

A. Purines and Pyrimidines

B. Prokaryotic DNA and Eukaryotic DNA

C. Euchromatin and Heterochromatin

D. Leading strand and Lagging strand

Answer:

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2. Each of the following questions/statements has four suggested answers. Rewrite the correct answer in each case:

DNA is a double helix and

A. Complementary and parallel

B. Complementary and antiparallel

C. Without supercoils

D. Always circular

Answer:

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3. Each of the following questions/statements has four suggested answers. Rewrite the correct answer in each case:

DNA is methylated at

A. A-residue

B. G-residue

C. Tresidue

D. Cresidue

Answer:

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4. A sequential expression of a set of human genes occurs when a steroid molecule binds to the

A. Messenger RNA

B. DNA sequence

C. Ribosome

D. Transfer RNA

Answer:

Watch Video Solution

5. Which form of RNA has a structure resembling clover leaf ?

A. rRNA

B. hnRNA

C. mRNA

D. tRNA

Answer:

Watch Video Solution

6. Mention one significant function of the following:

A. Jumping genes

B. mRNA

C. Endonuclease

D. Terminator

Answer:

Watch Video Solution

7. State the best known contribution of:

A. Marshall Nirenberg

B. D. Baltimore

C. Frederick Griffith

D. Walter Sutton

Answer:

Watch Video Solution

8. Expand the following:

A. GTP

B. TMV

C. HRV

D. GMP

Answer:

Watch Video Solution

9. Ilustrate schematically the process of initiation, elongation and termination during a gene transcription in a bacterium.

Watch Video Solution

10. How is lac operon 'switched on' in an E. coli cell?

Watch Video Solution

11. Give an account of post transcriptional modifications of a eukaryotic mRNA.

Watch Video Solution

Objective Type Questions Multiple Choice Question Mcq

1. Which one of the following does not follow the central dogma of molecular biology;

A. Pea

B. Mucor

C. Chlamydomonas

D. HIV

Answer: D

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2. Select the two correct statements out of the four given below about lac operon.

(i) Glucose or galactose may bind with the repressor and inactivate it.

(ii) In the absence of lactose the repressor binds with the operator region

(iii) The z-gene codes for permease

(iv) This was elucidated by Francois jacob and Jacque monod are:

A. II and III

B. I and III

C. II and IV

D. I and II

Answer: C

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3. The one aspect which is not a salient feature of genetic code, it its being

A. Degenerative

B. Ambiguous

C. Universal

D. Specific

Answer: B

Watch Video Solution

4. The process of copying genetic information from one strand of the DNA into RNA termed as

A. Translation

B. Transamination

C. Replication

D. Transcription

Answer: D

Watch Video Solution

5. In the Lac operon system, Beta-galactosidase is coded by

A. a-gene

B. i-gene

C. L-gene

D. zgene

Answer: D

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6. Match the codons with their respective amino acids and choose the correct answer.

A. UUU	1. Serine
B. GGG	2. Methionine
C. UCU	3. Phenylalanine
D. CCC	4. Glycine
E. AVG	5. Proline

	A	B	C	D	E	(Kerala CEE 2010)
(a)	3	4	1	5	2	❑
(b)	3	1	4	5	2	❑
(c)	3	4	5	1	2	❑
(d)	2	4	1	5	3	❑
(e)	2	4	1	3	5	❑

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7. Consider the following statements.

I. rRNA provides the template for synthesis of proteins.

II. tRNA brings amino acids and reads the genetic code.

III. RNA polymerase binds to promoter and initiates transcription.

IV. A segment of DNA coding for polypeptide is called intron.

A. I and III are correct

B. I and II are correct

C. I, II and III are correct

D. II and III are correct

Answer: D

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8. In bacteria, the formation of peptide bond during translation is effected by

A. Lysozyme

B. Ribozyme

C. Nucleosome

D. Microsome

Answer: B

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9. At 5' end of a polynucleotide chain

A. -OH group is attached

B. Phosphate group is attached

C. Pentose sugar is attached

D. H-bond is present

Answer: B

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10. Reverse transcriptase is also called

A. DNA dependent DNA polymerase

B. RNA dependent DNA polymerase

C. DNA dependent RNA polymerase

D. RNA dependent RNA polymerase

Answer: B

Watch Video Solution

11. During chain elongation, peptide bond is formed between carboxyl group of first and amino group of second amino acid by

A. Peptidyl transferase

B. Taq polymerase

C. DNA ligase

D. Helicase

Answer: A

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12. Balbiani rings are sites of

A. DNA replication

B. RNA and protein synthesis

C. Synthesis of lipids

D. Synthesis of polysaccharides

Answer: B

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

A. 64

B. 32

C. 60

D. 61

Answer: A

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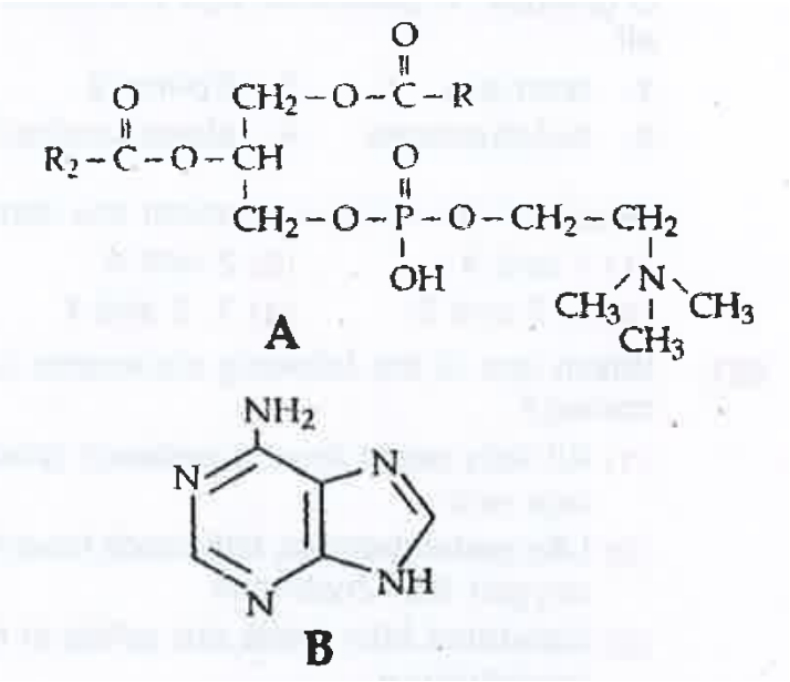
14. Which one fo the following structural formulae of two orgainc compounds is correctly identified along with its related function ?



A. B: Adenine-a nucleotide that makes up nucleic acids

B. A: Triglyceride-major source of energy

C. B: Uracil-a component of DNA

D. A: Lecithin-a component of cell membrane

Answer: B

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15. What are those structures that appear as 'beads'-on-string' in the chromosomes when viewed under electron microscope?

A. Genes

B. Nucleotides

C. Nucleosomes

D. Base pairs

Answer: C

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16. Gene regulation governing lactose operon of E. coli that involves the lac I gene product is

A. Positive and inducible because it can be induced by lactose a

B. Negative and inducible because repress or protein prevents transcription

C. Negative and repressible because repress or protein prevents transcription

D. Feedback inhibition because excess of B-galactosidase can switch off transcription

Answer: B

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17. In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are

A. G/34%, A/24.5, T/24.5%

B. G/17%, A/16.5%, T/32.5%

C. G/17%, A/33%, T/33%

D. G/8.5%, A/50%, T/24.5%

Answer: C

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18. Which one of the following is the starter codon?

A. UAA

B. UAG

C. AUG

D. UGA

Answer: C

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19. The amino acid Tryptophan is the precursor for the synthesis of

A. Estrogen and Progesterone

B. Cortisol and Cortisone

C. Melatonin and Serotonin

D. Thyroxine and Triiodothyronine

Answer: C

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20. Which of the following statements is not true for cancer cells in relation to mutations?

A. Mutations inactivate the cell control.

B. Mutations inhibit production of telomerase.

C. Mutations in proto-oncogenes accelerate the cell cycle.

D. Mutations destroy telomerase inhibitor.

Answer: B

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21. Match the terms in column I with their description in column II and choose the correct option.

	Column I		Column II
A.	Dominance	1.	Many genes govern a single character
B.	Codominance	2.	In a heterozygous organism only one allele expresses itself
C.	Pleiotropy	3.	In a heterozygous organism both alleles express themselves fully
D.	Polygenic inheritance	4.	A single gene influences many characters

(NEET-UG 2016)

	A	B	C	D
(a)	4	1	2	3
(b)	4	3	1	2
(c)	2	1	4	3
(d)	2	3	4	1

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22. A complex of ribosomes attached to a single strand of RNA is known as

A. If both Assertion and Reason are true and

B. Okazaki fragment

C. Polysome

D. Polymer

Answer: C

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Objective Type Questions Assertion And Reason Type Question

1. Assertion: The ability of certain DNA sequence in the genome to move from one site to another, without any sequence relationship is called transposition.

Reason:The message from nuclear DNA for the synthesis of specific cytoplasmic protein is called mRNA.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: B

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2. Assertion: Genetic code shows code in mRNA not in DNA.

Reason: DNA is present inside the nucleus and code is read by mRNA inside the cell.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

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3. Assertion: When Trytophan is present the repressor is unable to bind to the operator.

Reason: Transcription of structural genes occur.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: D

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4. Assertion: Constitutive genes are also known as house keeping genes.

Reason: Constitutive genes fail to express, as their products are not required for essential normal activities.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the

Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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5. Assertion: Few of repetitive sequence are called jumping genes.

Reason: They jump at place of location and do not change their position.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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6. Assertion: DNA molecule acts as a template for synthesis of both RNA and DNA.

Reason: DNA duplex has the feature of right handed coiling and antiparallel.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: B

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7. Assertion: Plasmids are being widely used as vehicle DNA.

Reason: They can easily isolate and introduce viral genome.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the

Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

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8. Assertion: The DNA contents are usually constant in a given species.

Reason: DNA replication is of continuous type.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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9. Assertion: For DNA replication RNA primer is needed.

Reason: Synthesis of new DNA chain is initiated by DNA polymerase.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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10. Assertion: Guanine cannot pair with cytosine.

Reason: Guanine and cytosine do not have perfect matching.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: D

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11. Assertion: The first codon discovered by Nirenberg and Matthaei was UUU.

Reason: Genetic code translates the language of protein into that of RNA.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: D

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12. Assertion: Replication of DNA is perfect.

Reason: Defect in DNA spoils the DNA.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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13. Assertion: Temin modified Crick's 'central dogma' to 'central dogma reverse'.

Reason: Crick was of the view that flow of genetic information in cells is bidirectional.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

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14. [A]: The genetic code is degenerate.

[R]: Because the most amino acids have more than one codon.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

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15. Assertion: An amino acid in polypeptide chain is not altered due to change in third base of codon.

Reason: It is due to Wobble hypothesis

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

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16. Assertion: Extranuclear DNA occurs in the cytoplasmic matrix.

Reason: It leaks out via nuclear pores into the cytoplasm.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: D

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17. Assertion: Mitochondrial DNA is similar to prokaryotic DNA.

Reason: Mitochondria are thought to have evolved from the prokaryotes.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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18. Assertion: A single mRNA strand is capable of forming a number of different polypeptide chains.

Reason: The mRNA chain has terminator codons.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: B

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19. Assertion: lonising radiations are harmful for the living organisms.

Reason: They form toxic photo products in the cells.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: C

Watch Video Solution

20. Assertion: Adenine cannot pair with cytosine.

Reason: Adenine and cytosine do not have a perfect

match between hydrogen donar and hydrogen accepter.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

Watch Video Solution

21. Assertion: hnRNA is larger than mRNNA.

Reason: hnRNA has no translating introns and more exons than required for translation.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: D

 Watch Video Solution

22. Assertion: mRNA attaches itself to ribosome via 3' end

Reason: mRNA has F-capsular nucleotide and basis for lagging sequence.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: B

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23. [A]: Replication and transcription occur in the nucleus but translation occurs in the cyto- plasm.

[R]: mRNA is transferred from the nucleus in the

cytoplasm where ribosomes and amino acids are available for protein synthesis.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

Watch Video Solution

24. Assertion: Amber codon is a terminating codon.

Reason: If in a mRNA, a termination codon is present, the protein synthesis stops abruptly whether the protein synthesis is complete or not.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reasom are false.

Answer: A

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Mcq

1. In a bacterium when RNA-polymerase binds to the promoter on a transcription unit during transcription, it

A. terminates the process

B. helps remove introns

C. initiates the process

D. inactivates the exons

Answer: C

View Text Solution

2. In a DNA strand, the nucleotides are linked together by:

A. glycosidic bonds

B. phosphodiester bonds

C. peptide bonds

D. hydrogen bonds

Answer: B

View Text Solution

3. With regard to mature mRNA in eukaryotes, which of the following is true?

A. Exons and introns do not appear in the mature RNA

B. Exons appear but introns do not appear in the mature mRNA

C. Introns appear but exons do not appear in the mature mRNA

D. Both exons and introns appear in the mature mRNA

Answer: B

View Text Solution

4. Which of the following is true with respect to AUG?

A. It codes for methionine only

B. It is an initiation codon

C. It codes for methionine in both prokaryotes and eukaryotes

D. All of the above

Answer: D

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5. RNA polymerase II is responsible for the transcription of:

A. tRNA

B. rRNA

C. hnRNA

D. SnRNA

Answer: C

View Text Solution

6. In eukaryotic cell, transcription, RNA splicing and RNA capping take place in:

A. Nucleus

B. Cytoplasm

C. Ribosomes

D. Golgi body

Answer: A

View Text Solution

7. Peptide synthesis in a cell takes place in:

A. chloroplast

B. ribosome

C. mitochondria

D. golgi body

Answer: B

View Text Solution

8. The human chromosome with the highest and least number of genes in them are respectively:

A. Chromosome 21 and Y

B. Chromosome 1 and X

C. Chromosome 1 and Y

D. Chromosome X and Y

Answer: C

View Text Solution

9. Khorana was awarded noble prize for:

A. discovering DNA

B. discovering RNA

C. chemical synthesis of gene

D. discovering DNA polymerase

Answer: C

View Text Solution

10. Who discovered DNA polymerase?

A. Okazaki

B. Kornberg

C. Messelson and Stahl

D. Watson and Crick

Answer: B

View Text Solution

11. Triplet UUU codes for:

A. leucine

B. methionine

C. phenylalanine

D. glycine

Answer: C

View Text Solution

12. A gene of operon which forms the repressor protein is:

A. Operator

B. Promoter

C. Regulator

D. Structural

Answer: C

View Text Solution

13. While analysing the DNA of an organism a total number of 5386 nucleotides were found out of which the proportion of different bases were: Adenine = 29%, Guanine = 17%, Cytosine = 32%, Thymine -17%.Considering the Chargaff's rule it can be concluded that:

A. it is a double stranded circular DNA

B. It is single stranded DNA

C. It is a double stranded linear DNA

D. No conclusion can be drawn

Answer: B

View Text Solution

14. Removal of introns in a transcription unit is:

A. Transformation

B. Splicing

C. Tailing

D. Capping

Answer: B

View Text Solution

15. Control of gene expression takes place at the level of

A. DNA replication

B. transcription

C. translation

D. None of these

Answer: B

View Text Solution

16. In E-coli, the lac operon gets switched on when:

A. lactose is present and it binds to the repressor

B. repressor binds to operator

C. RNA polymerase binds to the operator

D. lactose is present and it binds to RNA polymerase

Answer: A

View Text Solution

17. In the Lac operon system, β -galactosidase is encoded by

A. a-gene

B. i-gene

C. y-gene

D. z-gene

Answer: D

View Text Solution

18. A specific nucleotide sequence to which RNA polymerase attaches to initiate transcription of mRNA from a gene called:

A. promoter gene

B. structural gene

C. operon

D. regulation gene

Answer: A

View Text Solution

19. Which of the following play a role in protein synthesis?

A. Introns

B. Exons

C. Both (a) and (b)

D. None of the above

Answer: B

View Text Solution

20. Repressor protein is produced by:

A. Regulator gene

B. operator gene

C. structural gene

D. promoter gene

Answer: A

View Text Solution

21. The protein of DNA, which contains information for an entire polypeptide is called as

A. Cistron

B. Chromosome

C. Gene

D. Operon

Answer: A

View Text Solution

22. The promoter site and the terminator site for transcription are located at:

A. 3' (downstream) end and 5' (upstream) end, respectively of the transcription unit

B. 5' (upstream) end and 3' (downstream) end, respectively of the transcription unit

C. the 5' (upstream) end

D. the 3' (downstream) end

Answer: B

View Text Solution

23. Discontinuous synthesis of DNA occurs on one strand because:

A. DNA molecule being synthesized is very long

B. DNA dependent DNA polymerase catalyses polymerisation only in one direction (5' $\rightarrow$ 3')

C. It is a more efficient process

D. DNA ligase has to have some role

Answer: B

View Text Solution

24. RNA polymerase III transcribes:

A. hnRNA

B. tRNA

C. 5S rRNA

D. Both (b) and (c)

Answer: B

View Text Solution

25. Which was the last human chromosome to be completely sequenced:

A. Chromosome 1

B. Chromosome 11

C. Chromosome 21

D. Chromosome X

Answer: A

View Text Solution

26. In the absence of lactose, the operator gene of lac operon is suppressed by genetic material

A. Structural gene

B. Repressor protein

C. Regulator gene

D. Promoter gene

Answer: C

View Text Solution

27. Choose the incorrect pair.

A. Negative charged DNA wrapped around positive charged DNA-Nucleosome

B. Thread-like, colourless unit of structure Chromatin in nucleus

C. Unit of 8 molecules in histones-Histone octamer

D. Basic amino residues in histones-Lysines and arginines

Answer: D

View Text Solution

28. Hershey and Chase used 35 and 32P to prove that DNA is the genetic material. Their experiments proved that DNA is genetic material because:

A. loss of 355 in progeny viruses indicated that proteins were not passed on.

B. progeny viruses retained ^{32}P but not S^{35} .

C. retention of P^{32} in progeny viruses indicated that DNA was passed on.

D. All of the above

Answer: B

View Text Solution

29. Read the following statements and select the correct option.

(i) Loosely packed and lightly stained regions of chromatin are called heterochromatin. (ii) Densely packed and dark stained regions of chromatin are

called euchromatin. (iii) A typical nucleosome contains 200 bp of DNA helix.

A. (i) and (ii)

B. (iii)

C. (ii) and (iii)

D. (i), (ii), and (iii)

Answer: B

View Text Solution

30. DNA replication enzymes are given below. Select their correct sequence in DNA replication.

(i) Helicase (ii) Primase (iii) SSB (iv) DNA ligase (v) DNA polymerase

A. $(i) \rightarrow (ii) \rightarrow (iii) \rightarrow (v) \rightarrow (iv)$

B. $(i) \rightarrow (i) \rightarrow (iii) \rightarrow (v) \rightarrow (ii)$

C. $(iii) \rightarrow (ii) \rightarrow (i) \rightarrow (v) \rightarrow (iv)$

D. $(i) \rightarrow (iii) \rightarrow (ii) \rightarrow (v) \rightarrow (iv)$

Answer: D

View Text Solution

31. The Okazaki fragments in DNA chain:

A. polymerise in the 5' $\rightarrow$ 3' direction and explain 3' $\rightarrow$ 5' DNA replication.

B. prove semi-conservative nature of DNA replication.

C. result in transcription.

D. polymerise in the 3' $\rightarrow$ 5' direction and form replication fork.

Answer: A

View Text Solution

32. Escherichia coli fully labelled with ^{15}N is allowed to grow in ^{14}N medium. The two strands of DNA molecule of the first generation bacteria have:

A. same density but do not resemble with their parent DNA.

B. same density and resemble with their parent DNA.

C. different density and do not resemble with their parent DNA.

D. different density but resemble with their parent DNA.

Answer: C

View Text Solution

33. Which of the following are the functions of RNA?

A. It is a carrier of genetic information from DNA to ribosomes synthesising polypeptides.

B. It carries amino acids to ribosomes.

C. It is a constituent component of ribosomes.

D. All of the above

Answer: D

View Text Solution

34. Initiation codon of protein synthesis in Eukaryotes is :

A. GUA

B. GGA

C. CCA

D. AUG

Answer: D

View Text Solution

35. Promoter and terminator flanks the:

A. transcription unit

B. recon

C. structural gene

D. house-keeping gene

Answer: C

View Text Solution

36. Nitrogenous bases are linked to sugar by:

A. phosphodiester bond

B. N-glycosidic bond.

C. O-glycosidic bond.

D. hydrogen bond.

Answer: B

View Text Solution

37. Meselson and Stahl's Experiment proved:

A. Transduction

B. Transformation

C. DNA is the genetic material

D. Semiconservative DNA replication

Answer: C

View Text Solution

38. In Meselson and Stahl's experiments, heavy DNA was distinguished from normal DNA by centrifugation in

A. CsOH gradient

B. CsCl gradient.

C. $^{15}NH_2Cl$

D. $^{14}NH_2Cl$

Answer: B

View Text Solution

39. Select incorrect match.

A. Purines-Adenine and Guanine

B. Pyrimidines-Cytosine and Uracil

C. Nucleosides-Adenosine and Thymidine

D. DNA-Basic biomolecule

Answer: D

View Text Solution

40. Refer to the given steps of DNA replication.

(i) Exposure of DNA strands (ii) Synthesis of RNA primer (iii) Activation of deoxyribonucleotides (iv) Chain formation (v) Base pairing (vi) Proof reading and DNA repair (vii)DNA polymerase attaches at ori site

Select the correct sequence of DNA replication.

A.

$(vii) \rightarrow (iii) \rightarrow (i) \rightarrow (ii) \rightarrow (v) \rightarrow (iv) \rightarrow (vi)$

B.

$(iii) \rightarrow (i) \rightarrow (vii) \rightarrow (ii) \rightarrow (v) \rightarrow (iv) \rightarrow (vi)$

C.

$(vii) \rightarrow (i) \rightarrow (iii) \rightarrow (ii) \rightarrow (v) \rightarrow (iv) \rightarrow (vi)$

D. $(i) \rightarrow (iii) \rightarrow (ii) \rightarrow (v) \rightarrow (iv) \rightarrow (vi)$

Answer: A

View Text Solution

41. The enzyme DNA-dependent RNA polymerase catalyses the polymerisation reaction in direction:

A. Only 5' $\rightarrow$ 3'

B. Only 3' $\rightarrow$ 5'

C. Both (a) and (b)

D. None of these

Answer: A

View Text Solution

42. Transcription is the transfer of genetic code from a DNA molecule to:

A. RNA molecule

B. Second DNA molecule

C. Ribosomal sub unit

D. Sequence of amino acids in a protein molecule

Answer: A

View Text Solution

Mcq Choose The Odd One Out Of The Following

1. Which of the following is odd one out?

A. Bacteriophage lambda has 48502 base pairs

B. Escherichia coli has 4.6×10^6 base pairs

C. Haploid content of human DNA is 3.3×10^9 base pairs

D. Bacteriophage known as $\phi \times 174$ has 5006 nucleotides

Answer: D

View Text Solution

2. Which of the following is odd one out with reference to scientists who involved in mechanism of DNA duplication?

A. Alec Jeffreys

B. Marshal Nirenberg

C. Har Gobind Khorana

D. Severo Ochoa

Answer: A

View Text Solution

Mcq Fill In The Blanks

1. In a DNA molecule, the phosphate group is attached to carbon ..... of the sugar residue of its own nucleotide and carbon ..... B ..... of the sugar residue of the next nucleotide.....C.....by bonds.

A. A-5', B-3', C-phosphodiester

B. A-5', B-3', C-glycosidic

C. A-3', B-5', C-phosphodiester

D. A-3', B-5', C-glycosidic

Answer: A

View Text Solution

2. DNA as an acidic substance present in nucleus was first identified by.....A..... in 1869, he named it as .....B.....

	A	B
(a)	Wilkins and Franklin	double helix
(b)	Miescher	nuclein
(c)	Watson and Crick	DNA
(d)	Chargaff	nuclein

View Text Solution

3. The fully processed hnRNA, called.....A..... is transported out of the ..... B..... into the .....C.....

for translation

A. A-mRNA, B-cytoplasm, C-nucleus

B. A-RNA, B-nucleus, C-cytoplasm

C. A-IRNA, B-cytoplasm, C-nucleus

D. A-mRNA, B-nucleus, C-cytoplasm

Answer: D

View Text Solution

4. For initiation, the ribosomes bind to the .....A..... at the start codon and .....B..... is recognised by the ..... C.....

A. A-mRNA, B-AUG, C-initiator tRNA

B. A-mRNA, B-AUG, C-tRNA

C. A-rRNA, B-AUG, C-initiator tRNA

D. A-rRNA, B-AUG, C-tRNA

Answer: A

View Text Solution

5. Length of the DNA with 23 base pairs is .....

A. 78-4 Å

B. 78-2 Å

C. 78 Å

D. 74.8 Å

Answer: D

View Text Solution

6. If a double-stranded DNA has 20% cytosine, percentage of adenine in it .....

A. 0.6

B. 0.3

C. 0.4

D. 0.2

Answer: B

View Text Solution

7. Methyl guanosine triphosphate is added at 5' end of hnRNA in a process of

A. splicing

B. capping

C. tailing

D. None of these

Answer: B

View Text Solution

8. In bacteria, the transcription and translation takes place in the same compartment because.....

A. No separation of cytosol and nucleus

B. Presence of nucleus

C. Separation of cytosol and nucleus

D. Separation of cytoplasmic organelles

Answer: A

View Text Solution

9. The strand which do not code for any protein is called.....

A. template strand

B. non-coding strand.

C. coding strand

D. antisense strand.

Answer: C

View Text Solution

10. ..... is not applicable to RNA.

A. 5' phosphoryl and 3' hydroxyl ends

B. Chargaff's rule

C. Complementary base pairing

D. Watson and Crick

Answer: C

View Text Solution

Mcq Match The Following

1. Match column I with column II:

Column I	Column II
A. Helicase	(i) RNA priming
B. DNA polymerase III	(ii) Unwinding of DNA
C. Gyrase	(iii) Opening of DNA
D. Primase	(iv) Joining of nucleotides

A. A-(ii), B-(iv), C-(i), D (iii)

B. A-(iv), B-(iii), C-(i), D-(ii)

C. A-(iii), B-(iv), C-(ii), D-(i)

D. A-(ii), B-(i), C-(iii), D-(iv)

Answer: C

View Text Solution

2. In Griffith's experiment, what would be the effect of following conditions on mice?

Form of *Pneumococcus* injected	Effect on mice
A. Live rough non-capsulated	A
B. Live smooth capsulated	B
C. Heat-killed smooth	C
D. Heat-killed smooth + live rough	D

A. A-Survived, B-Died, C-Died, D-Survived

B. A-Died, B-Survived, C-Died, D-Died

C. A-Died, B-Survived, C-Survived, D-Died

D. A-Survived, B-Died, C-Survived, D-Died

Answer: D

View Text Solution

3. Match the Column I with Column II and select the correct option.

Column I	Column II
A. F. Miescher	(i) DNA double helix
B. Hershey and Chase	(ii) X-ray diffraction studies
C. Watson and Crick	(iii) Bacteriophage
D. Wilkins and Franklin	(iv) Nuclein

A. A-(iv), B-(iii), C-(ii), D-(i)

B. A-(iii), B-(iv), C-(i), D-(ii)

C. A-(iv), B-(iii), C-(i), D-(ii)

D. A-(iii), B-(iv), C-(ii), D-(i)

Answer: C

View Text Solution

4. Match Column I with Column II.

Column I	Column II
A. Sigma factor	(i) $5' \rightarrow 3'$
B. Capping	(ii) Initiation
C. Tailing	(iii) 5′ end
D. Coding strand	(iv) 3′ end

A. A-(ii), B-(iv), C-(iii), D-(i)

B. A-(iv), B-(iii), C-(i), D-(ii)

C. A-(iii), B-(iv), C-(ii), D-(i)

D. A-(ii), B-(iii), C-(iv), D-(i)

Answer: D

View Text Solution

5. Match Column I with Column II and select the correct option.

Column I	Column II
A. Operator	(i) Codes for repressor molecule
B. Structural gene	(ii) Binding site for RNA polymerase
C. Regulatory gene	(iii) Codes for protein/enzyme
D. Promoter	(iv) Binding site for repressor molecule

A. A-(iv), B-(ii), C-(iii), D-(i)

B. A-(ii), B-(i), C-(iii), D-(iv)

C. A-(iv), B-(iii), C-(i), D-(ii)

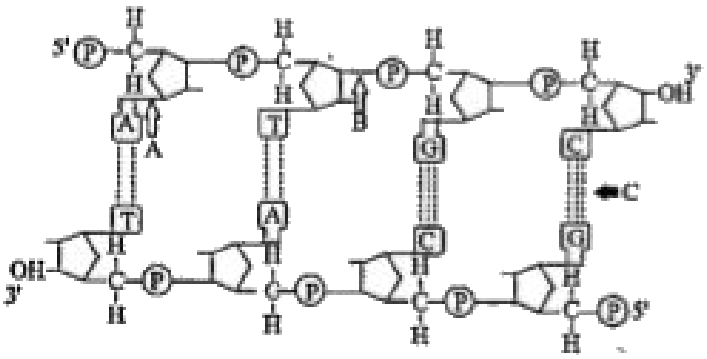
D. A-(ii), B-(iv), C-(i), D-(iii)

Answer: C

View Text Solution

Mcq Figure Based Questions

1. In the given diagram of chemical structure of DNA, identify the type of bonds shown by A, B, and C.



A. A-Hydrogen bond, B-Hydrogen bond, C-N glycosidic bond

B. A-N-glycosidic bond, B-Hydrogen bond, C-Phosphodiester bond

C. A-N-glycosidic bond, B-Phosphoester bond, C-Hydrogen bond

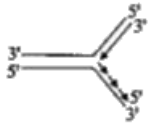
D. A-Phosphoester bond, B-N-glycosidic bond, C-Hydrogen bond

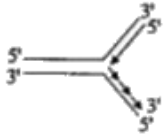
Answer: C

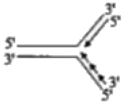
View Text Solution

2. Which of the following figures correctly represents the replication fork formed during DNA replication?

A. 

B. 

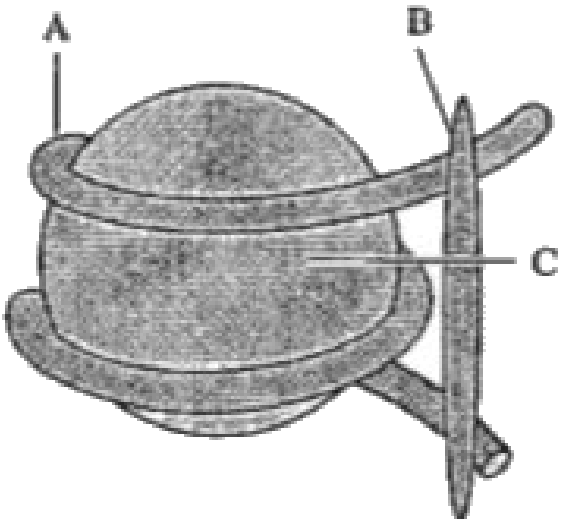
C. 

D. 

Answer: C

View Text Solution

3. Refer the given figure of nucleosome and select the option that correctly identifies the parts A, B, and C.



A. A-DNA, B-Histone octamer, $C - H_1$ histone

B. A-Histone octamer, $B - H_1$ histone, C-DNA

C. A-H, histone, B-DNA, C-Histone octamer

D. A-DNA, $B - H_1$ histone, C-Histone octamer

Answer: D

View Text Solution

4. The given figure represents one of the steps in the process of transcription in bacteria. Identify the step

and label A and B marked in the figure.

A. Step-Termination, A-RNA polymerase, B-Sigma factor

B. Step-Initiation, A-DNA polymerase, B-Rho factor

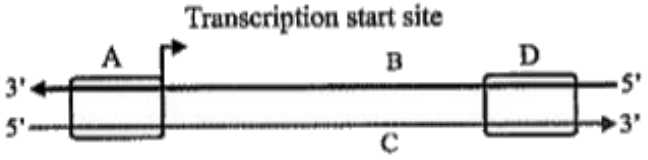
C. Step-Elongation, A-RNA polymerase, B-Sigma factor

D. Step-Termination, A-RNA polymerase, B-Rho factor

Answer: D

View Text Solution

5. Given diagram represents the schematic structure of a transcription unit with some parts labelled as A, B, C, and D. Select the option which shows its correct labelling.



A. A-Terminator, B-Template strand, C-Coding strand, D-Promoter

B. A-Promoter, B-Coding strand, C-Template strand, D-Terminator

C. A-Terminator, B-Coding strand, C-Template strand, D-Promoter

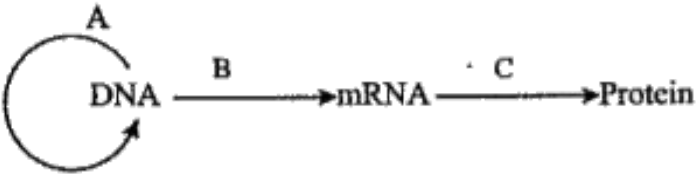
D. A-Promoter, B-Template strand, C-Coding strand, D-Terminator

Answer: D

View Text Solution

6. The diagram given below shows an important concept (proposed by D) in the genetic implication of DNA. The process occurring in that concept are

marked as A and B. Identify A, B, C, and D.



A. A-Translation, B-Transcription, C-Replication, D-Erwin Chargaff

B. A-Replication B-Transcription C-Translation D-Francis Crick

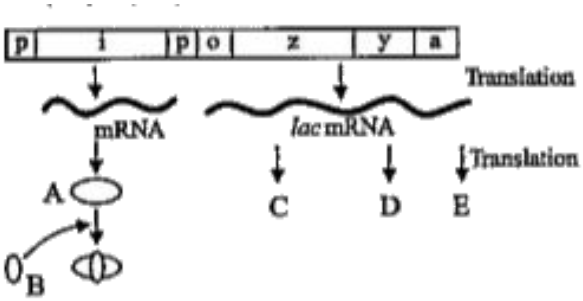
C. A-Transcription, B-Replication, C-Transcription, D-James Watson

D. A-Replication, B-Translation, C-Transcription, D-Francis Crick

Answer: B

View Text Solution

7. The given figure shows lac operon and its functioning. Select the option which correctly labels A, B, C, D, and E.



A. A-Repressor, B-Inducer, C-β -galactosidase, D-Permease, E-Transacetylase

B. A-Inducer, B-Repressor, C-Transacetylase, D-β -galactosidase, E-Permease

C. A-Repressor, B-Inducer, C-β-galactosidase, D-Transacetylase, E-Permease

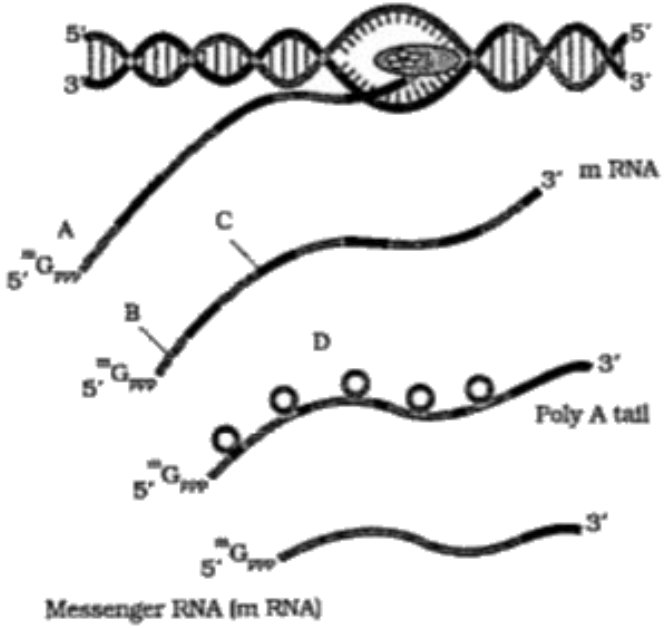
D. A-Inducer, B-Repressor, C-Transacetylase, D-Permease, E-β -galactosidase

Answer: A

View Text Solution

8. The image given below represents the post transcriptional modification of primary transcript in

eukaryotes. The processes and the parts of the primary transcript are labelled from A to E. Select the option for the correct identification for the labels.



Messenger RNA (m RNA)

A. A-Capping, B-Exon, C-Intron D-Tailing, E-Splicing

B. A-Tailing, B-Exon, C-Intron, D-Splicing, E-Capping

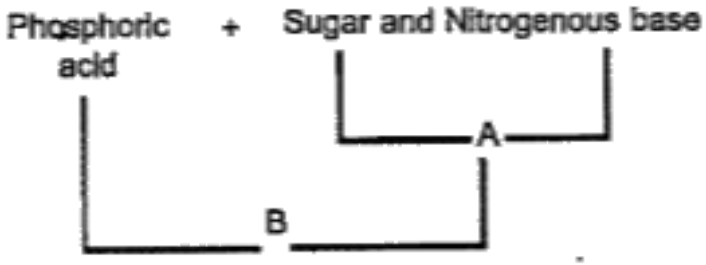
C. A-Splicing, B-Intron, C-Exon, D-Tailing, E-Capping

D. A-Capping, B-Intron, C-Exon, D-Splicing, E-Tailing

Answer: D

View Text Solution

9. What does A and B represent in the given representation?



A. A-Nucleoside, B-Nucleotide

B. A-Ribonucleoside, B-Deoxyribonucleoside

C. A-Ribonucleotide, B-Deoxyribonucleotide

D. A-Nucleotide, B-Nucleoside

Answer: A

View Text Solution

Mcq Assertion And Reason

1. Assertion: The two chains of DNA have anti parallel polarity.

Reason: In one chain of DNA, ribose sugar at 5' end consists of a free phosphate moiety while at the other end the ribose has a free 3'-OH group.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not the correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Both assertion and reason are false.

Answer: A

View Text Solution

2. Assertion: In transcription, the strand with 3' $\rightarrow$ 5' polarity acts as the template strand.

Reason: The RNA polymerase catalyses the polymerisation in only one direction, i.e., 5' $\rightarrow$ 3'.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not the correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Both assertion and reason are false.

Answer: A

View Text Solution

3. Assertion: The predominant site for control of gene expression in prokaryotes is transcription initiation.

Reason: The activity of RNA polymerase is regulated by accessory proteins, which affect recognition of start sites.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not the correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Both assertion and reason are false.

Answer: A

View Text Solution

4. Assertion: The accessibility of promoter regions of prokaryotic DNA is in many cases regulated by the interaction of proteins with operators.

Reason: The operator region is adjacent to the promoter elements in most operons and in most cases the sequences of the operator bind a repressor protein.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not the correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Both assertion and reason are false.

Answer: A

View Text Solution

5. Assertion: Frameshift mutations form the genetic basis of proof that codon is a triplet.

Reason: Insertion or deletion of one or two bases changes the reading frame from the point of insertion or deletion.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not the correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Both assertion and reason are false.

Answer: C

View Text Solution

Mcq Source Based Questions

1. Read the passages and answer the questions that follow

Molecular basis of inheritance involves the study of genes, genetic variations and heredity. It explains how an offspring looks similar to the parents. DNA, RNA and genetic code form the basis of the molecular basis of inheritance. They transmit the hereditary genes from the parents to the offspring. DNA carries all the genetic information of an individual. When it replicates each strand gives rise to a daughter strand and passes the genetic information to it. This way it forms the basis of inheritance.

How many types of nucleic acids are present in the living systems?

A. One

B. Two

C. Three

D. Four

Answer: B

View Text Solution

2. Read the passages and answer the questions that follow

Molecular basis of inheritance involves the study of genes, genetic variations and heredity. It explains how an offspring looks similar to the parents. DNA, RNA

and genetic code form the basis of the molecular basis of inheritance. They transmit the hereditary genes from the parents to the offspring. DNA carries all the genetic information of an individual. When it replicates each strand gives rise to a daughter strand and passes the genetic information to it. This way it forms the basis of inheritance.

Through which among the following linkages are the two nucleotides connected through the 3-5' end?

A. Phosphodiether linkage

B. Phosphodisulphide linkage

C. Phosphodinitrate linkage

D. Phosphodiester linkage

Answer: D

View Text Solution

3. Read the passages and answer the questions that follow

Molecular basis of inheritance involves the study of genes, genetic variations and heredity. It explains how an offspring looks similar to the parents. DNA, RNA and genetic code form the basis of the molecular basis of inheritance. They transmit the hereditary genes from the parents to the offspring. DNA carries all the genetic information of an individual. When it replicates each strand gives rise to a daughter strand

and passes the genetic information to it. This way it forms the basis of inheritance.

Which among the following is the exact ratio of guanine to cytosine in a DNA double helical structure?

A. $3:2$

B. $2:1$

C. $1:3$

D. $1:1$

Answer: D

View Text Solution

4. Read the passages and answer the questions that follow

Molecular basis of inheritance involves the study of genes, genetic variations and heredity. It explains how an offspring looks similar to the parents. DNA, RNA and genetic code form the basis of the molecular basis of inheritance. They transmit the hereditary genes from the parents to the offspring. DNA carries all the genetic information of an individual. When it replicates each strand gives rise to a daughter strand and passes the genetic information to it. This way it forms the basis of inheritance.

Which is the correct complementary strand for AGAATTCGC?

A. CTCCGGATA

B. GAGGCCTAT

C. TCTTAAGCG

D. GTGGCCATA

Answer: C

View Text Solution

5. Read the passages and answer the questions that follow

Molecular basis of inheritance involves the study of genes, genetic variations and heredity. It explains how an offspring looks similar to the parents. DNA, RNA

and genetic code form the basis of the molecular basis of inheritance. They transmit the hereditary genes from the parents to the offspring. DNA carries all the genetic information of an individual. When it replicates each strand gives rise to a daughter strand and passes the genetic information to it. This way it forms the basis of inheritance.

During DNA replication, Okazaki fragments are used to elongate:

A. the lagging strand towards replication fork.

B. the leading strand away from replication fork.

C. the lagging strand away from the replication fork.

D. the leading strand towards replication fork.

Answer: C

View Text Solution

6. Read the passages and answer the questions that follow

The genetic code may be defined as the exact sequence of DNA nucleotides read as three letter words or codons, that determines the sequence of amino acids in protein synthesis. In other words, the genetic code is the set of rules by which information encoded in genetic material (DNA or RNA sequences)

is translated into proteins (amino acid sequences) by living cells. Genetic code is the full set of relationships between codons and amino acids (or stop signals). It is basically the way through which the A, C, G and T are strung together.

Which of the following is not a feature of the genetic code?

A. Triplet

B. Degenerate

C. Non-overlapping

D. Ambiguous

Answer: D

View Text Solution

7. Read the passages and answer the questions that follow

The genetic code may be defined as the exact sequence of DNA nucleotides read as three letter words or codons, that determines the sequence of amino acids in protein synthesis. In other words, the genetic code is the set of rules by which information encoded in genetic material (DNA or RNA sequences) is translated into proteins (amino acid sequences) by living cells. Genetic code is the full set of relationships between codons and amino acids (or stop signals). It is basically the way through which the A, C, G and T are

strung together.

Which of the following is not a termination codon?

A. UGA

B. AGA

C. AGG

D. UAC

Answer: D

View Text Solution

8. Read the passages and answer the questions that follow

The genetic code may be defined as the exact sequence of DNA nucleotides read as three letter words or codons, that determines the sequence of amino acids in protein synthesis. In other words, the genetic code is the set of rules by which information encoded in genetic material (DNA or RNA sequences) is translated into proteins (amino acid sequences) by living cells. Genetic code is the full set of relationships between codons and amino acids (or stop signals). It is basically the way through which the A, C, G and T are strung together.

The codon is a

A. Singlet

B. Duplet

C. Triplet

D. Quadruplet

Answer: C

View Text Solution

9. Read the passages and answer the questions that follow

The genetic code may be defined as the exact sequence of DNA nucleotides read as three letter words or codons, that determines the sequence of amino acids in protein synthesis. In other words, the genetic code is the set of rules by which information

encoded in genetic material (DNA or RNA sequences) is translated into proteins (amino acid sequences) by living cells. Genetic code is the full set of relationships between codons and amino acids (or stop signals). It is basically the way through which the A, C, G and T are strung together.

The first amino acid added by the RNA is added to the anticodon

A. AUG

B. UAC

C. ACG

D. UGC

Answer: B

View Text Solution

10. Read the passages and answer the questions that follow

The genetic code may be defined as the exact sequence of DNA nucleotides read as three letter words or codons, that determines the sequence of amino acids in protein synthesis. In other words, the genetic code is the set of rules by which information encoded in genetic material (DNA or RNA sequences) is translated into proteins (amino acid sequences) by living cells. Genetic code is the full set of relationships between codons and amino acids (or stop signals). It is basically the way through which the A, C, G and T are

strung together.

Which of the following statement can be concluded from the graph below?

`

(##OSW_GRU_MCQ_ISC_XII_SM1_BIO_C06_E01_083_Q01.png" width="80%">

A. GC pairings are more stable because they have 3 hydrogen bonds, so they require a higher temperature to break.

B. GC pairings are more stable because they have 2 hydrogen bonds, so they require a higher temperature to break.

C. AT pairings are more stable because they have 3 hydrogen bonds, so they require a higher temperature to break.

D. AT pairings are more stable because they have 2 hydrogen bonds, so they require a higher temperature to break.

Answer: A

View Text Solution

11. Read the passages and answer the questions that follow

Occasionally, situations arise in which people require concrete, scientific evidence of parent age, whether it be their own or that of someone else. In most instances, maternity is easy to determine. Unfortunately, questions of paternity aren't so easy to answer. In order to make a determination of fatherhood, scientists almost always work backwards--from the child to the potential parent-to ascertain the actual nature of the relationship. The process of DNA fingerprinting first became available for paternity testing in 1988. Before this sort of DNA analysis was available, blood types were the most common factor considered in human paternity testing. Blood groups are a popular example of Mendelian genetics at work. After all, there are numerous human blood groups

with multiple alleles, and these alleles exhibit a range of dominance patterns.

Which of the following statements regarding DNA fingerprinting is false?

A. DNA fingerprinting cannot be used for paternity testing

B. DNA profile using STR (short terminal repeats) is unique to an individual

C. PCR is used for DNA profiling

D. Forensic analysis makes use of SNPs (single nucleotide polymorphisms) in coding sequences to distinguish between individuals

Answer: A

View Text Solution

12. Read the passages and answer the questions that follow

Occasionally, situations arise in which people require concrete, scientific evidence of parent age, whether it be their own or that of someone else. In most instances, maternity is easy to determine. Unfortunately, questions of paternity aren't so easy to answer. In order to make a determination of fatherhood, scientists almost always work backwards--from the child to the potential parent-to ascertain the

actual nature of the relationship. The process of DNA fingerprinting first became available for paternity testing in 1988. Before this sort of DNA analysis was available, blood types were the most common factor considered in human paternity testing. Blood groups are a popular example of Mendelian genetics at work. After all, there are numerous human blood groups with multiple alleles, and these alleles exhibit a range of dominance patterns.

Who was the first person to develop DNA finger printing?

A. David Suzuki

B. Khorana

C. Alec Jaffreys

D. Gilbert

Answer: C

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13. Read the passages and answer the questions that follow

Occasionally, situations arise in which people require concrete, scientific evidence of parent age, whether it be their own or that of someone else. In most instances, maternity is easy to determine. Unfortunately, questions of paternity aren't so easy to answer. In order to make a determination of

fatherhood, scientists almost always work backwards--from the child to the potential parent-to ascertain the actual nature of the relationship. The process of DNA fingerprinting first became available for paternity testing in 1988. Before this sort of DNA analysis was available, blood types were the most common factor considered in human paternity testing. Blood groups are a popular example of Mendelian genetics at work. After all, there are numerous human blood groups with multiple alleles, and these alleles exhibit a range of dominance patterns.

During DNA profiling, DNA nucleotides hybridized with the probe can be detected through .....

A. Electrophoresis

B. Polymerase chain reaction

C. Autoradiography

D. Hybridoma

Answer: C

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Electrophoresis helps to separate.....

A. DNA segments

B. Cells from DNA

C. Tissues

D. RNA from DNA

Answer: A

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15. Read the passages and answer the questions that follow

An operon is a cluster of bacterial genes along with an adjacent promoter that controls the transcription of those genes. In E.coli, and many other bacteria, genes

encoding several different proteins may be located on a single transcription unit called an operon. The genes in an operon share the same transcriptional regulation, but are translated individually. Eukaryotes generally do not group genes together as operons (exception is C. elegans and a few other species). E. coli encounters many different sugars in its environment. These sugars, such as lactose and glucose, require different enzymes for their metabolism. Whenever glucose is present, E. coli metabolizes it before using alternative energy sources such as lactose, arabinose, galactose, and maltose. Only when the supply of glucose has been exhausted does RNA polymerase start to transcribe the lac genes efficiently, which allows E. coli to metabolize lactose. Three of the

enzymes for lactose metabolism are grouped in the lac operon: lacZ, lacy, and lacA. In the presence of lactose and absence of glucose, cyclic AMP (CAMP) joins with a catabolite activator protein that binds to the lac promoter and facilitates the transcription of the lac operon.

Lac operon is an example of:

A. Only positive regulation

B. Only negative regulation

C. Both positive and negative regulation

D. Sometimes positive sometimes negative

Answer: C

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16. Read the passages and answer the questions that follow

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In the presence of lactose, how long does it take for the lac operon to be expressed?

A. When lactose equals glucose concentration

B. When glucose is more than lactose concentration

C. As long as lactose is more than glucose concentration

D. As long as lactose is more than galactose concentration

Answer: C

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17. Read the passages and answer the questions that follow

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glucose is present, E. coli metabolizes it before using alternative energy sources such as lactose, arabinose, galactose, and maltose. Only when the supply of glucose has been exhausted does RNA polymerase start to transcribe the lac genes efficiently, which allows E. coli to metabolize lactose. Three of the enzymes for lactose metabolism are grouped in the lac operon: lacZ, lacy, and lacA. In the presence of lactose and absence of glucose, cyclic AMP (CAMP) joins with a catabolite activator protein that binds to the lac promoter and facilitates the transcription of the lac operon.

Which of these acts as an inducer of the lac operon?

A. Allolactose

B. Lactose

C. Galactose

D. Glucose

Answer: A

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18. Read the passages and answer the questions that follow

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operon: lacZ, lacy, and lacA. In the presence of lactose and absence of glucose, cyclic AMP (CAMP) joins with a catabolite activator protein that binds to the lac promoter and facilitates the transcription of the lac operon.

In a cell as per the Operon Concept, the regulator gene governs the chemical reactions by:

A. Inhibiting the substrate in the reaction

B. Inhibiting migration of mRNA into cytoplasm

C. mRNA transcription inhibited

D. Enzyme-reaction inactivation

Answer: D

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19. Read the passages and answer the questions that follow

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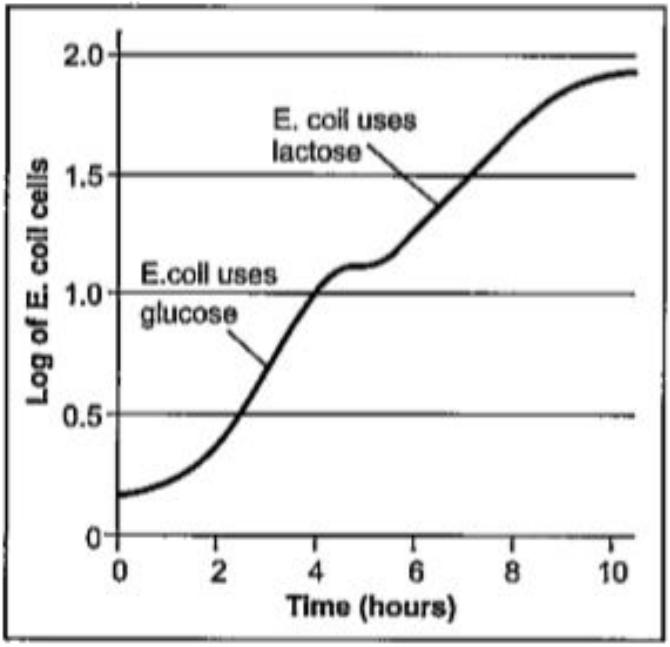
The following statements are drawn as conclusions

from the graph given below:



I. When grown in the presence of two substrates, E. coli uses the preferred substrate in this case glucose) until it is depleted. Then, enzymes needed for the metabolism of the second substrate are expressed and growth resumes, although at a slower rate. II. When grown in the presence of two substrates, E. coli uses both the substrates equally. III. When grown in the

presence of two substrates, E. coli uses the less preferred substrate in this case glucose) until it is depleted. Then, enzymes needed for the metabolism of the second substrate are expressed and growth resumes, although at a faster rate. IV. When grown in the presence of two substrates, E. coli uses only one substrate

Choose from below the correct alternative.

A. Only I is true

B. I, and IV are true

C. III and II are true

D. I and III are true

Answer: A

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20. Read the passages and answer the questions that follow

Transcription is a process in which information is rewritten. Transcription is something we do in our everyday lives, and it is also something our cells must do, in a more specialised and narrowly defined way. In biology, transcription is the process of copying out the DNA sequence of a gene in the similar alphabet of RNA. Transcription is the first step in gene expression, in which information from a gene is used to construct a functional product such as a protein. The goal of transcription is to make a RNA copy of a gene's DNA

sequence. For a protein-coding gene, the RNA copy, or transcript, carries the information needed to build a polypeptide (protein or protein subunit). Eukaryotic transcripts need to go through some processing steps before translation into proteins. The following DNA strand is used as a template for transcription 3' CGTAAGCGGCT 5'.

Which of the following RNA strands will be produced?

A. 5' AGCCGCUUACG 3'

B. 5' GCAUUCGCCGA 3'

C. 5' CGUAAGCGGCU 3'

D. 5'UCGGCGAAUGC 3'

Answer: B

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21. Read the passages and answer the questions that follow

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The enzyme required for transcription is:

A. RNAase

B. DNA polymerase

C. RNA polymerase

D. Restriction enzymes

Answer: C

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22. Read the passages and answer the questions that follow

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The main function of tRNA with regards to protein synthesis is:

A. Proofreading

B. Identifies amino acids and transports them to ribosomes

C. Inhibits protein synthesis

D. All of the above

Answer: B

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Mark the statement which is INCORRECT about the transcription unit?

A. It is a transcribed segment of DNA.

B. Eukaryotes have monocistronico transcription unit.

C. Prokaryotes also have a monocistronic transcription unit.

D. Immediate product of transcription is primary transcript.

Answer: C

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