



BIOLOGY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

MOLECULAR BASIS OF INHERITANCE

Very Short Answer Questions

1. Transcriptionally active chromatin is



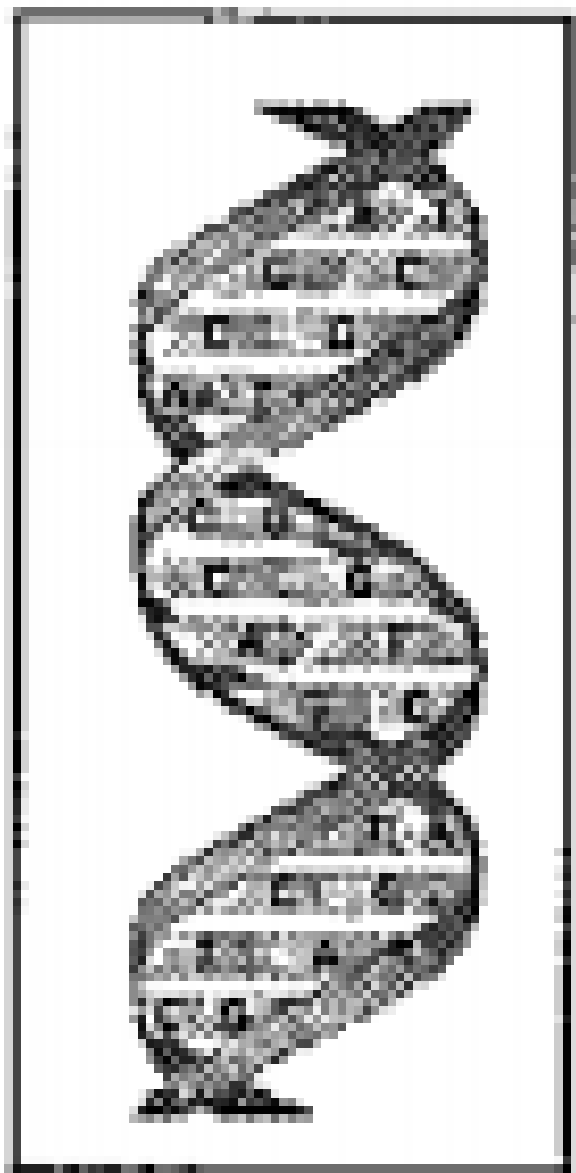
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2. Genetic material in Animal virus is mostly



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3. The following picture depicts the DNA. What is the structure of DNA



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4. What are the components of nucleic acid ?



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5. If the sequence of the coding strand in a transcription unit is written as follows: 5

ATGCATGCATGCATGCATGCATGC-3

Write down the sequence of mRNA



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6. Who established that RNA can be genetic material?



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7. Termination of transcription is by



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8. What is the difference between exons and Introns ?



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9. What is tailing of mercury ? How is it removed ?



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10. What is point mutation? Give one example.



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11. What is meant by charging of tRNA ?



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12. The initiator codon is



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

amino acid in protein synthesis or as "Start" or
(2003) "Stop" codon?



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14. The strand of DNA which is complimentary
to the template strand is



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15. What are the main differences between
DNA and RNA?



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16. In a typical DNA molecule the proportion of thymine is 30 % of the N bases. Find out the percentages of other N bases.



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17. The proportion of nucleotides in a given nucleic acid are Adenine 18 % , Guanine 30 % , Cytosine 42 % and uracil 10 % . Name the

nucleic acid and mention the number of strands in it.



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Short Answer Questions

1. Define transformation in Griffith's Experiment. Discuss how it helps in the identification of DNA as genetic material.



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2. The most recive isotope of H is



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3. A single base mutation in a gene may not always result in loss or gain of function. Do you think the statement is correct ? Defined your answer.



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4. Types of RNA polymerase required in nucleus for RNA synthesis



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5. What are the contributions of George Gamow, H.G. Khorana, Marshall Nirenberg in deciphering the genetic code ?



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6. On the diagram of the secondary structure of tRNA shown below label the location of the following parts.



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7. Draw the schematic/diagrammatic presentation of the lac operon.



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8. What are the main differences between DNA and RNA?



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9. The important features of genetic code are

- a) It is universal
- b) It is commaless
- c) It is not degenerate
- d) Third base is not always specific.



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10. Write briefly on nucleosomes.



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Important Questions

1. Genetic material of virus is



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2. Which enzyme is used in the polymerase chain reaction?



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3. What are the components of nucleic acid ?



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Exercise

1. Group the following as nitrogenous bases and nucleosides: Adenine, Cytidine, Thyrnine, Guanosine, Uracil and Cytosine.



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2. If a double stranded DNA has 20 per cent of cytosine, calculate the per cent of adenine in the DNA.



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

5-ATGCATGCATGCATGCATGCATGC-3

Write down the sequence of complementary strand in 5 → 4 direction.





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4. If the sequence of the coding strand in a transcription unit is written as follows: 5
ATGCATGCATGCATGCATGCATGCATGC-3

Write down the sequence of mRNA



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5. In DNA model of Watson & Crick, the major grooves are site of



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6. Depending upon the chemical nature of the template (DNA or RNA) and the nature of nucleic acids synthesised from it (DNA or RNA). List the types of nucleic acid polymerases.



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7. How did Hershey and Chase differentiate between DNA and protein in their experiment

while proving that DNA is the genetic material?



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8. Differentiate between the followings:

(a) Repetitive DNA and Satellite DNA

(b) mRNA and tRNA

(c) Template strand and Coding strand



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(a) Repetitive DNA and Satellite DNA

(b) mRNA and tRNA

(c) Template strand and Coding strand



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10. Last two essential roles of ribosome during translation.



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



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12. Explain (in one or two lines) the functions of the followings :

Promoter



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13. Explain (in one or two lines) the functions of the followings :

tRNA



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14. Explain (in one or two lines) the functions of the followings :

Exons.



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15. Briefly describe the following:

(a) Transcription

(b) Polymorphism

(c) Translation

(d) Bioinformatics



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16. Briefly describe the following:

(a) Transcription

(b) Polymorphism

(c) Translation

(d) Bioinformatics



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17. Number of nucleotides per one turn of DNA double helix is



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18. In an experiment, DNA is treated with a compound which tends to place itself

amongst stacks of nitrogenous base pairs. As a result of this, the distance between two consecutive base pairs increases. From 0.34 nm to 0.44 nm calculate the length of DNA double helix (which has 2×10^9 bp) in the presence of saturating amount of this compound.



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19. Recall the experiments done by Frederick Griffith. Where DNA was speculated to be the

genetic material. If RNA, instead of DNA was the genetic material, would the heat killed strain of pneumococcus have transformed the R - strain into virulent strain ? Explain ?



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



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21. 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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22. What is optical density and how is it different from mass density ?



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23. The central dogma of molecular genetics states that the genetic information flows from



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24. If there are 2.9×10^9 complete turns in a DNA molecule. Estimate the length of the molecule (1 angstrom = 10^{-8} cm).



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