BIOLOGY

BOOKS - BETTER CHOICE PUBLICATION

MOLECULAR BASIS OF INHERITANCE

Very Short Answer Type Questions

1. Write the function of promoter gene.

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2. Write the function of t-RNA.

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3. Write the function of Exon.

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4. Which organic molecule other than protein can act as biocatalysts?

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5. What is Cistron?

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6. What is DNA probe ? Write its two uses.

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7. What is an exon?

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8. What is an Intron?

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9. What was the major objective of the human genome project?

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10. Name the enzyme which is used to link DNA segments together.

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11. Why DNA fingerprinting technique is named as Souther Blotting?

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12. Name two applications of DNA fingerprinting.

13. Name the enzyme that can break and reseal the strand of DNA.

14. Name two scientists who have significantly contributed to describe the genetic code.

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15. Who proposed one Gene one Polypeptide theory?

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16. Who proposed the semi-conservative mode of replication of DNA?

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17. What are Okazaki fragments ?

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18. How many bases code for one amino acid ?

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19. Give the site for protein synthesis.

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20. Give name of one amino acid which has one codon only.

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21. Name two scientists who used X-rays to cause mutations in Neurospora.

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22. Name two scientists who proved experimentally that DNA replication is semi-conservative.

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23. Name two scientists who proposed double helical structure of DNA.

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24. At what stage a recombinant DNA is made in meiosis ?

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25. What are anticodons ?

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Short Answer Type Questions

1. Differentiate between m-RNA and t-RNA.

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2. Differentiate between template and coding strand.

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3. Differentiate between repetitive DNA and satellite DNA.

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4. Which one is bigger in molecular size, Enzyme or DNA? How did you know?

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5. Write two differences between leading strand and lagging strand.

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6. Differentiate between codon and anticodon.

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7. Difference between spontaneous and induced mutations?

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8. Differentiate

transformation and transduction.

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9. What do you understand by anti-parallel arrangement of DNA strand ?

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10. Why both the strands of DNA do not act as template for RNA synthesis ?

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11. Why DNA and ribosomes are located at different sites in a cell ?

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12. Name the technique used for separation of DNA fragments. What is its principle ?

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13. Why is human genome project called a mega project ?

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14. Explain the structure of m-RNA.

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15. Explain the structure of t-RNA.

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16. Explain the functions of (a) Promoter (b) t-RNA and (c) Exons.

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17. Write central dogma of molecular biology.

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18. Give Meselson and Stahl's experiment to prove that DNA replication is semiconservative mode of replication.

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19. What is DNA finger printing? What are the applications of DNA finger printing?

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20. Name two non-sense codons. What is the role of non-sense codons in protein synthesis?

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21. What is inducer in the lac operon? How does it ensure the "switching on" or of genes?

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22. What do you mean by semiconservative mode of replication?

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23. Write six differences between DNA and RNA.

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24. Differentiate between transformation, transduction and conjugation.

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25. Write three differences of each of the following :

(a) Lytic and lysogenic phases of the life cycle of a virus.

(b) Induction and repression.

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26. Describe Watson and Crick model of DNA.

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27. Name the types of RNA and explain any one type.

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28. Write a brief note on Griffith's experiment on Streptococcus pneumoniae.

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29. Explain in brief lytic cycle of virus.

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30. What are induced mutations ? Write about physical and chemical mutagens responsible for induced mutations.

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31. What is DNA probe ? Write its two uses.

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32. What is Operon ? Define types of genes which make up an operon.

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33. Describe briefly the mechanism of DNA replication.

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Long Answer Type Questions

1. Give salient features of human genome.

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2. Give a brief account of DNA replication.

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3. Describe the transcription of RNA from DNA.

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4. Describe the various steps of protein synthesis.

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5. What is the genetic code? Who deciphered genetic code? Give the characteristics of genetic code.

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6. Name the biological material used by Messelson and Stahl to prove the semi conservative nature of replication of DNA. Explain the experiment with suitable diagrams.

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7. (a) What is DNA finger printing?

(b) Explain southern blotting technique of DNA finger printing.

(c) Write down the significance of above technique.

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8. Explain the Iac-operon of E.coli with the help of schematic representation.

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Most Expected Questions

1. Define genetic code.

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2. Differentiate between Euchromatin and Heterochromatin.

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3. Expand VNTR.

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4. Name the repeating unit in chromatin?

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5. Name any three viruses which have RNA as the genetic material.

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6. Who discovered the biochemical nature of transforming principle in Griffith's experiments?

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7. If the sequence of coding strand in a transcription unit is as follows 5-ACTG CATGCC ATTG CATA=3' Write the squence of m-RNA.

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8. Name a codon, which has dual function. Give functions.

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9. Draw a labelled diagram of replicating fork.

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10. What is the difference between nucleoside and nucleotide ?

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11. Differentiate between Euchromatin and Heterochromatin.

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12. Why do histones have the charge and give their use.

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13. How is the DNA better genetic material than RNA?

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14. Retroviruses do not follow central dogma. Comment.

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15. Why is DNA molecule more stable genetic material than RNA? Explain.

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16. RNA is the first genetic material. Highlight some of the facts and points about * RNA.

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17. A microbiologist found that some bacteria infected by phages, had developed the ability to make a particular amino acid that they could not make earlier. What was this ability

probably because of? Explain this phenomenon briefly.

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18. (a) Draw a neat labelled diagram of a nucleosome.

(b) Mention what enables histones to acquire a positive charge.

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19. (a) Explain with the help of schematic representation the lac operon of E. coli:

(b) Mention the role of lactose in this operon.

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20. With the help of schematic structure, explain the transcription unit.

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21. List any four major goals of Human Genome project.

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22. Explain giving reasons that RNA is the first genetic material.

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23. (a) Why is DNA considered a better genetic.

(i) Which one of an intron and an exon is the reminiscent of antiquity?

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24. How is the process of m-RNA synthesis different in eukaryotes than in prokaryotes.

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25. (a) Genetic codes can be universal and degenerate. Write about them, giving one example of each.

(b) Explain aminoacylation of the t-RNA.

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26. How an inducible operon differs from repressible operon?

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27. Enlist the role of following in protein synthesis

(i) m-RNA, (ü)r-RNA, (ii) t-RNA.

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28. Differences between Inducible and Repressible Operon ?

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29. How did Hershey and Chase prove that DNA is the hereditary material? Explain their experiment witluspitable diagrams.

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30. 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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31. Give an account of Hershey and Chase experiment. What did it conclusively prove? If both DNA and proteins contained phosphorus and sulphur do you think the result would have been the same?

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32. What are introns and exons ? What process ensures a linear arrangement of

ammo cids although the genes are discontinuous ?

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33. What are exons and introns ? What process removes the unwanted RNA regions and ins these codes for amino acids ?

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34. (a) Differentiate between code, codon and anticoden.

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

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35. What is the Human Genome Project? What has been revealed about our gen so far?

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36. (a) A length of DNA helix is far greater than the dimension of a typical nuc Then how is long DNA polymer packaged in a cell?

(b) What would happen if histones were to be mutated and made rich in acidic ai acids instead of basic amino acids such as lysine and arginine?

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