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**Max Time : 1 ½ hr** **Class = 12th Biology Test**  **Max Marks : 40**

**MOLECULAR BASIS OF IHERITANCE**

1. Multiple choice questions : [ 1 X 5 = 5]
2. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6 x 109 bp, then the length of DNA is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2.5 m | b) 2.2 m | c) 2.7 m | d) 2.0 m |

1. The enzymes DNA dependent RNA polymerase catalysis the polymerization reaction in \_\_\_\_\_\_\_\_\_ direction :

|  |  |  |  |
| --- | --- | --- | --- |
| a) only 5’-3’ | b) only 3’-5’ | c) both direction | d) none of these |

1. What will be the sequence of mRNA produced by the following stretch of DNA?

5’ TACGTACGTACGTACG 3’

|  |  |
| --- | --- |
| a) 3’ AUCGAUCGAUCGAUCG 5’ | b) 5’ UACGUACGUACGUACG 3’ |
| c) 3’ UACGUACGUACGUACG 5’ | d) 5’ AUCGAUCGAUCGAUCG 3’ |

1. The codon causing chain termination is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) TAG , TAA , TGA | b) GAT , AAT , AGT | c) AGT , TAG , UGA | d) UAA , UAG , UGC |

1. DNA strand on a gel stained with ethidium bromide when viewed under UV radiation, appears as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) yellow bands | b) bright orange bands | c) dark red bands | d) bright blue bands |

1. Name the transcriptionally active region of chromatin in a nucleus? [ 1 ]
2. Mention 2 function of codon AUG. [ 1 ]
3. Why hnRNA is required to undergo splicing? [ 1 ]
4. A DNA segment has a total of 1500 nucleotides, out of which 410 are Guanine containing nucleotides. How many pyrimidines bases this DNA segment possesses? [ 2 ]
5. Why is the Human Genome Project called a ‘Mega Project’? [ 2 ]
6. State the function of following in a prokaryotes: (a) tRNA (b) rRNA [ 2 ]
7. List the salient features of double helix structure of DNA. [ 2 ]
8. Describe Bioinformatives? [ 2 ]
9. (a) Why did Hershey and Chase use radioactive sulphur and radioactive phosphorus in their experiment? [ 3 ]

(b) Write the conclusion they arrived at and how.

1. Describe the initiation , elongation and termination process of transcription in bacteria. [ 3 ]
2. Describe how the lac operon operates, in the presence of an inducer. [ 3 ]
3. (a) How are the following formed and involved ion DNA packaging in a nucleus of a cell? [ 3 ]

(i) Histone octamer (ii) nucleosome (iii) chromatin

(b) Differentiate between Euchromatin and Heterochromatin.

1. Explain the process of translation in a bacterium. [ 5 ]
2. Explain the steps of DNA fingerprinting that will help in processing of two blood samples A and B picked up from crime scene. [ 5 ]