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**Max Time : 1 hr** **Class = 12th Biology Test**  **Max Marks : 20**

**MOLECULAR BASIS OF INHERITANCE**

**[Transduction , DNA Replication , Transcription]**

1. Multiple choice questions : [ 1 X 6 = 6]
2. The different types of RNAs transcribed by RNA polymerase III in eukaryotes is :

|  |  |
| --- | --- |
| a) t-RNA , hnRNA , 28 S rRNA | b) 28 S rRNA , 18 S rRNA , 5 S rRNA |
| c) t-RNA , 5 S rRNA , SnRNA | d) hnRNA , 18 S rRNA , 28 S rRNA |

1. Given below is the list of steps Meselson and Stahl carried out in their experiment to prove the DNA replication is semi-conservative. Select the option that gives the correct sequence of steps followed by them.
2. Bacteria contains either all N14 DNA or all hybrid DNA.
3. Bacteria transferred to a N14 medium and samples at every 20 minutes.
4. All bacteria contain N15DNA.
5. Bacteria contains hybrid DNA (N14DNA and N15 DNA).
6. Bacteria grow in N15 medium for many generations.

|  |  |
| --- | --- |
| a) (ii) (iv) (iii) (i) (v) | b) (i) (ii) (v) (iv) (iii) |
| c) (v) (iii) (ii) (iv) (i) | d) (v) (iii) (i) (iv) (ii) |

1. In some viruses, DNA synthesized by using RNA as a template. Such DNA is called as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) A-DNA | b) B-DNA | c) c-DNA | d) r-DNA |

1. If Meselson and Stahl experiment is continued for 6th generation in bacteria, the ratio of heavy strands N15/N15 : Hybrid N15/N14 : Light N14/N14 containing DNA in the 6th generation is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 : 1 : 1 | b) 0 : 1 : 7 | c) 0 : 1 : 15 | d) 0 : 1 : 31 |

**Assertion-Reason Type Questions**

**DIRECTIONS :** In each of the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R) just below it. Of the statements, mark the correct answer as:

1. If both assertion and reason are true, but reason is the true explanation of the assertion.
2. If both assertion and reason are true, but reason is not the true explanation of the assertion.
3. If assertion is true, but reason is false.
4. If assertion is false, but reason is true.
5. **Assertion:** m-RNA attaches to ribosomes through its 5’end.

**Reason:** The m-RNA has bases of lagging sequence.

1. **Assertion:** DNA replication is semi-conservative in nature.

**Reason:** In each cycle of replication the complementary strands of parental double helix is conserved.

1. What is the role of DNA ligase during DNA replication. [ 1 ]
2. Differentiate between a template and coding strand. [ 1 ]
3. Name the enzyme responsible for continuous replication of DNA strand. [ 1 ]
4. Retrovirus does not follow Central dogma. Comment. [ 2 ]
5. Name indicating their function, a few additional enzymes , (other than DNA polymerase and DNA ligase) that involved in the DNA replication. [ 2 ]
6. Given below is one of the strands of a DNA segment: 3’ 5’ [ 2 ]
7. Write its complementary DNA strand.
8. Write a possible RNA strand that can be transcribed from the above DNA molecule formed.
9. Explain the role of S35 and P32 in the experiments conducted by Hershey and Chase. [ 2 ]
10. Write the process of DNA replication in brief. [ 3 ]