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| **PERIODIC TEST I (2023-24)**  **SET-2** | | | | | | | | | | |
| **Subject: BIOLOGY**  **Grade: XII** | | | Max. Marks:35Time: 1.5 Hrs | | | | | | | |
| **Name:** | | | | | | | **Section:** | **Roll No:** | | |
| ***General Instructions:***   * *This question paper consists of 4 printed pages.* * *All answers to be written in the answer sheet provided.* * All questions are compulsory. * The question paper has five sections: Section A, Section B, Section C , Section D and Section E. There are 18 questions in the question paper. * Section–A has 10 questions of 1 mark each. * Section–B has 2 questions of 2 marks each. * Section–C has 4 questions of 3 marks each. * Section D has 1 case study question of 4 marks. * Section E has 1 Question of 5 marks. * Wherever necessary, neat and properly labeled diagrams should be drawn. | | | | | | | | | | |
|  | **SECTION A** | | | | | | | | 1\*10 | |
|  | If the DNA codons are ATG ATG ATG and a cytosine base is inserted at the beginning, then which of the following will result? | | | | | | | | | |
|  | **a.** | CAT GAT GAT G | | | **b.** | | A non-sense mutation | | | |
|  | **c.** | C ATG ATG ATG | | | **d.** | | CA TGA TGA TG | | | |
| **2.** | Anticodon is an unpaired triplet of bases in an exposed position of | | | | | | | | | |
|  | **a.** | tRNA | | | **b.** | | mRNA | | | |
|  | **c.** | rRNA | | | **d.** | | both (B) and (C) | | | |
| **3.** | The association of histone H1 with a nucleosome indicates that | | | | | | | | | |
|  | **a.** | DNA replication is occurring | | | **b.** | | the DNA is condensed into a chromatin fibre | | | |
|  | **c.** | the DNA double helix is exposed | | | **d.** | | transcription is occurring | | | |
| **4.** | Which one of the following makes use of RNA template to synthesize DNA? | | | | | | | | | |
|  | **a.** | DNA polymerase | | | **b.** | | RNA polymerase | | | |
|  | **c.** | Reverse transcriptase | | | **d.** | | DNA dependant RNA polymerase | | | |
| **5.** | Protein synthesis in an animal cell occurs | | | | | | | | | |
|  | **a.** | only on the ribosomes present in cytosol | | | **b.** | | only on ribosome attached to the nuclear envelope and endoplasmic reticulum | | | |
|  | **c.** | on ribosome present in the nucleolus as well as in cytoplasm | | | **d.** | | on ribosomes present in cytoplasm as well as in mitochondria. | | | |
| 6. | Purines found both in DNA and RNA are | | |  | |  | | | |
|  | **a.** | cytosine and thymine | | | **b.** | | adenine and thymine | | | |
|  | **c.** | adenine and guanine | | | **d.** | | guanine and cytosine | | | |
| 7 | Semi-conservative replication of DNA was first demonstrated in | | | | | | | | | |
|  | **a.** | Escherichia coli | | | **b.** | | Streptococcus pneumoniae | | | |
|  | **c.** | Salmonella typhimurium | | | **d.** | | Drosophila melanogaster. | | | |
| 8 | Antiparallel strands of a DNA molecule means that | | | | | | | | | |
|  | **a.** | one strand turns clockwise | | | **b.** | | one strand turns anti-clockwise | | | |
|  | **c.** | the phosphate groups of two DNA strands, at their ends, share the same position | | | **d.** | | the phosphate groups at the start of two DNA strands are in opposite position (pole). | | | |
|  | Question No. 9 to 10 consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:  a) Both A and R are true, and R is the correct explanation of A.  b) Both A and R are true, and R is not the correct explanation of A.  c) A is true but R is false.  d) both Assertion and Reason are false. | | | | | | | |  | |
| **9** | **Assertion :** Central dogma is the flow of information from DNA to mRNA and then decoding the information present in mRNA in the form of protein.  **Reason :** In retroviruses, reverse of central dogma occurs. | | | | | | | |  | |
| **10** | **Assertion :** UAA, UAG and UGA terminate protein synthesis**.**  **Reason :** They are not recognized by tRNA | | | | | | | |  | |
|  | **SECTION B** | | | | | | | | 2\*2 | |
| **11.** | Give two reasons why both the strands of DNA are not copied during transcription. | | | | | | | | 2 | |
| **12.** | Write the four criteria which a molecule must fulfill to act as genetic material. | | | | | | | | 2 | |
|  | **SECTION -C** | | | | | | | | 4\*3 | |
| **13.** | Write the significance of heavy isotope of nitrogen in Meselson and Stahl Experiment. | | | | | | | | 3 | |
| **14.** | Write any six features of human genome. | | | | | | | | 3 | |
| **15.** | If you repeat Hershey chase experiment with two isotopes P32 and N15 in place of S35 in the original experiment, what results you can expect?  **OR**  Enumerate the post-transcriptional modifications in a eukaryotic mRNA. | | | | | | | | 3 | |
| **16.** | Explain how the hnRNA becomes the mRNA. | | | | | | | | 3 | |
|  | **SECTION -D** | | | | | | | | 1\*4 | |
|  | Q. No. 17 is case-based question which has 3 subparts with internal choice in one subpart. | | | | | | | |  | |
| 17. | Study the following illustration and answer the questions below:    a) Considering that information from strand ‘X’ is to be transcribed, identify and name the parts  labelled as „a‟, „b‟, „c‟ and „d‟.  b) Explain the function of each of the labelled part.  OR  b) Name the enzyme involved in the process and how the same enzyme does initiation and termination? | | | | | | | |  | |
|  | **SECTION -E** | | | | | | | | 1\*5 | |
| **18** | (a) Describe the series of experiments conducted by Frederick Griffith. Comment on the  significance of the results obtained.  (b) State the contributions of Oswald Avery, Colin McLeod and Maclyn McCarthy.  **OR**  Diagrammatically explain the experiments which helped prove-  a) Transforming principle is DNA  b) DNA replicates semi conservatively. Also name the scientists involved. | | | | | | | |  | |