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| **PT1/BIAK/1223/A 25-APR-2023** | | | | | | |
| **PERIODIC TEST I (2023-24)** | | | | | | |
| **Subject: BIOLOGY**  **Grade: XII** | | | Max. Marks:35Time: 1.5 Hrs | | | |
|  | **SECTION A** | | | | | 1\*10 |
|  | b | | | | | |
| **2.** | a | | | | | |
| **3.** | a | | | | | |
| **4.** | d | | | | | |
| **5.** | b | | | | | |
| **6.** | **c** |  | |  |  | |
| **7.** | a | | | | | |
| **8.** | d | | | | | |
|  | 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 false | | | | |  |
| **9** | **c** | | | | |  |
| **10** | **b** | | | | |  |
|  | **SECTION B** | | | | | 2\*2 |
| **11.** | (a) 5′−TTACGTGATAATCC−3′  (b) 5′−UUACGUGAUAAUCC−3′  OR  During the process of replication of DNA, each of the parental DNA strands is used as a template. The strand which is elongating from the template in 3'→5' direction will grow continuously but the strand which is growing from template having polarity 5'→3' will grow discontinuously because RNA primer will be formed at 5' end only so discontinuous strand will require many RNA primer and strand will be synthesized in small segments or Okazaki segments. | | | | | 2 |
| **12.** | (1) RNA molecules with different sequences will be produced and hence proteins with different sequences will be produced. (2) double stranded RNA molecules will be produced that would prevent translation of dsRNA. | | | | | 2 |
|  | **SECTION -C** | | | | | 4\*3 |
| **13.** | (a)The region where the repressor protein will attach normally is the 'operator region' or O. It is a short region of DNA which interacts with the regulatory protein that controls the transcription of the operon. (b) Repressor is unable to attach at this site in presence of an inducer which is Lactose.  OR  It can be divided into four stages: (1) preparation of clones comprising the entire genome of an organism; (2) collection of DNA sequences of clones; (3) generation of contig assembly; and (4) database development. (can refer to NCERT) | | | | | 3 |
| **14.** | 1) Methylated Guanine cap helps in binding of mRNA to smaller ribosomal sub-unit during initiation of translation.  2) Poly-A tail provides longevity to mRNA's life. Tail length and longevity of mRNA are positively correlated.  **OR**  Post-transcriptional modifications of pre-mRNA, such as capping, splicing, and polyadenylation, take place in the nucleus. After these modifications have been completed, the mature mRNA molecules have to be translocated into the cytoplasm, where protein synthesis occurs. | | | | | 3 |
| **15.** | The selection of phosphorus and Sulphur was based on the fact that DNA contains phosphorus while protein contains Sulphur. In this experiment phosphorus was used as a marker for DNA. Similarly, Sulphur was used as a marker for protein. By tracing the movement of Sulphur and phosphorus; it was easier to trace the movement of DNA and protein through subsequent generations. But nitrogen is present In DNA as well as in protein. Hence, use of N15  N will not help in finding whether the DNA or protein is the genetic material. | | | | | 3 |
| **16.** | a) DNA ligase is a type of enzyme that facilitates the joining of DNA strands together by catalyzing the formation of a phosphodiester bond) DNA polymerases are enzymes that create DNA molecules by assembling nucleotides, the building blocks of DNA., Replication, proof reading(any other valid) c) The DNA-dependent RNA polymerase is an essential enzyme of transcription of replicating systems of prokaryotic and eukaryotic organisms as well as cytoplasmic DNA viruses. | | | | | 3 |
|  | **SECTION -D** | | | | | 1\*4 |
|  | Q. No. 17 is case-based question which has 3 subparts with internal choice in one subpart. | | | | |  |
| 17. | a) 1952, Alfred Hershey and Martha Chase    b) The Transforming Principle. Oswald Avery & co-workers (1944)  c)The Rnase is an enzyme that destroys protein. Therefore DNA, RNA and proteins from heat killed S-strand of bacteria when added to . R. strain changed surface character and also made them pathogen.  d) Transformation of R into S strain did not occur in the culture containing heat killed S strain + R strain + DNase. DNase enzyme degrades the DNA and hence it is indicated that DNA is the transforming principle.  **OR**  A DNA molecule is made up of two linked strands that wind around each other to resemble a twisted ladder in a helix-like shape. Each strand has a backbone made of alternating sugar (deoxyribose) and phosphate groups. Attached to each sugar is one of four bases: adenine (A), cytosine (C), guanine (G) or thymine (T).(Refer to text book for more points) | | | | |  |
|  | **SECTION -E** | | | | | 1\*5 |
| **18** |  | | | | |  |

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