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| **PT1/BIAK/1222/A 09-MAY-2022** | | | |
| **PERIODIC TEST I (2022-23)**  **Answer Key- SET-1** | | | |
| **Subject: BIOLOGY**  **Grade: XII** | | Max. Marks:35Time: 1.5 Hrs | |
|  | **SECTION A** | | 5 |
|  | **a** | | |
| **2.** | **a** | | |
| **3** | **c** | | |
| **4.** | **a** | | |
| **5** | **a** | | |
|  | **SECTION B** | |  |
| **6.** | Sugar B is more reactive as it has hydroxyl group at 2’ position.  Explanation:  The sugar A is deoxyribose sugar present in DNA and lack the hydroxyl group at 2’ position.  The sugar B is ribose sugar present in RNA and shows hydroxyl group at 2’ carbon. This hydroxyl group makes it more reactive as this group can acts as a catalyst.  The hydroxyl group can react with the other chemical compounds and can be converted into alkoxide ion that breaks the RNA structure.  The presence of hydroxyl group makes the RNA as the primitive genetic material as its ability of fast replication and acts as a catalyst. | | 2 |
| **7.** | No. Because the codons AUG for methionine & UGG for tryptophan are not degenerate. (b) It is the phenomenon in which an amino acid is coded by more than one codon. | | 2 |
| **8.** | The biological process of DNA synthesis naturally occurs in 5′ to 3′ direction. In the double-stranded DNA, the strands are parallel and antiparallel to each other. During the synthesis of DNA, both the strands act as templates and only one (3′ to 5′ direction) can synthesize the parallel strand in 5’→3′ direction. The other strand 5′ to 3′ is synthesized in the opposite direction producing small stretches of DNA known as Okazaki fragments. This is the reason for the discontinuous synthesis of DNA on one of the parental strands.  OR   1. A polymer has at one end a free phosphate moiety at 5′- end of ribose sugar which is referred to as 5′-end of a polynucleotide chain. Similarly, at the other end of the polymer, the ribose has a free 3-OH group which is referred to as the 3′-end of a polynucleotide chain. 2. A nitrogenous base is linked to pentose sugar through an N-glycosidic linkage to form nucleoside. | | 2 |
| **9.** | 1. Methylated guanosine cap plays a primary role in the attachment of the Mrna to the smaller sub-units of the ribosome during translation initiation. 2. The Poly-A tail functions by increasing the length of the Mrna and also provides longevity to the Mrna | | 2 |
| **10.** | (a) Template strand. Because it is in 3’ to 5’ direction. (b) 5’-GUG CAC CUG ACU CCU GAG GAG-3’ | | 2 |
|  | **SECTION -C** | |  |
| **11.** | (a) Coding strand has 5′ end at the promoter or 5’TCAGTACA3′  (b) 5′ UCAGUACA 3′  © The two RNA will be complimentary and may form double stranded RNA and it prevents the translation. | | 3 |
| **12.** | .(a) Prokaryotic transcription  (b) RNA polymerase  ©sigma and Rho factor. | | 3 |
| **13.** | .(1) Splicing-the introns are removed, and exons are joined together.  (2) capping -methyl guanosine triphosphate is added to the 5-end of hnRNA.  (3) Tailing- adenylate residues (200-300) are added at 3-end in a template After these three processes, fully processed Mrna is released from nucleus into cytoplasm for protein synthesis. | | 3 |
| **14.** | (a) Degeneracy – A single amino acid is represented by many codons (degenerate codons)  (b) Stop codons are UAA, UAG,UGA | | 3 |
| **15.** | 1)The use of 15N will not give any conclusive result because it is only a heavy isotope of nitrogen.  2)In the original experiment, 35S was detected only in the supernatant as it was incorporated in protein only, while 15N will be incorporated into proteins as well as in DNA and hence it would appear both in the supernatant and in the sediment as well.  3)Infection, Blending ,Centrifugation  **OR**   1. DNA-dependent DNA polymerase- catalyzes the polymerization of deoxynucleotides, 2. Okazaki fragments- joined together by DNA ligase. 3. Helicases and topoisomerase enzymes – unwinding of the DNA helix. | | 3 |
|  | **SECTION -D** | |  |
| **16.** | 1)b , 2 a), 3)-b-10, 34 Å 4) a 5)c | | 5 |

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