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| **PERIODIC TEST I ANSWER KEY (2022-23)**  **SET-2** | | | | | |
| **Subject: BIOLOGY**  **Grade: XII** | | Max. Marks:35Time: 1.5 Hrs | | | |
| **Name:** | | | **Section:** | **Roll No:** | |
|  | **SECTION A** | | | | 5 |
|  | c | | | | |
| **2.** | a | | | | |
| **3.** | d | | | | |
| **4.** | c | | | | |
| **5.** | b | | | | |
|  | **SECTION B** | | | |  |
| **6.** | a.Contains nitrogen base and a pentose sugar.  b. Messelson and Stahl. | | | | ½\*4 |
| **7.** | (1)Exons are coding sequences that forms part of mRNA,Introns are non –coding  sequences that donot become part of mRNA.(2) Exons are joined together during  splicing to make the information continous, Introns are removed during splicing. | | | | 1+1 |
| **8.** | DNA strand with polarity 3’-> 5’ called template strand is transcribed as RNA polymerase can function only in 5’->3’ direction because it is complementary to the 3’->5’ direction of the template . | | | | 1+1 |
| **9.** | a. 11 -Last one being the stop codon  b.Start codon and codes for Methionine.  OR | | | | 1+1 |
| **10.** | a) What was the objective of the following experiment? -To prove that DNA replication is semi conservative  b) Who performed it-Messelson and Stahl  c) How was the DNA separated into different layers? -Based on density by centrifugation  d) Name any other scientist who had performed experiment to prove the same.  Very similar experiments involving use of radioactive thymidine to  detect distribution of newly synthesised DNA in the chromosomes was  performed on *Vicia faba* (faba beans) by Taylor and colleagues in 1958. | | | | ½\*4 |
|  | **SECTION -C** | | | |  |
| **11.** | (a)A transcription unit in DNA is defined primarily by the three regions in the DNA:   1. A promoter 2. The structural gene 3. A terminator   Description: Describe transcription in eukaryotes - Biology - Molecular Basis of ...  (b)The strand that acts as a template has 3’ to 5’ polarity. It has a promotor sequence upstream (i.e 5’ end of the coding strand) and a terminator sequence downstream (3’ end of the coding strand) | | | | 2+1 |
| **12.** | According to Chargaff's rule, the DNA molecule should have an equal ratio of pyrimidine (cytosine and thymine) and purine (adenine and guanine). It means that the number of adenine molecules is equal to thymine molecules and the number of guanine molecules is equal to cytosine molecules. % A = % T and % G = % C If dsDNA has 20% of cytosine, then according to the law, it would have 30% of guanine. Thus, percentage of G + C content = 60% The remaining 40% represents both A + T molecule. Since A and T are always present in equal numbers, the percentage of adenine molecule is 20%. | | | | 1+1+1 |
| **13.** | Hershey and Chase worked with bacteriophage and E.coli to prove that DNA is the genetic material. They used different radioactive isotopes to label DNA and protein coat of the bacteriophage. They grew some bacteriophages on a medium containing radioactive phosphorus ( 32P) to identify DNA and some on a medium containing radioactive sulphur ( 35S) to identify protein. Then, these radioactive labelled phages were allowed to infect E.coli bacteria. After infecting, the protein coat of the bacteriophage was separated from the bacterial cell by blending and then subjected to the process of centrifugation. Since the protein coat was lighter, it was found in the supernatant while the infected bacteria got settled at the bottom of the centrifuge tube. Hence, it was proved that DNA is the genetic material as it was transferred from virus to bacteria | | | | 2+1 |
| **14.** | In eukaryotes, there are two additional complexities –  (i) There are at least three RNA polymerases in the nucleus (in addition  to the RNA polymerase found in the organelles). There is a clear  cut division of labour. The RNA polymerase I transcribes rRNAs (28S, 18S, and 5.8S), whereas the RNA polymerase III is responsible  for transcription of tRNA, 5srRNA, and snRNAs (small nuclear  RNAs). The RNA polymerase II transcribes precursor of mRNA, the  heterogeneous nuclear RNA (hnRNA).  (ii) The second complexity is that the primary transcripts contain both  the exons and the introns and are non-functional. Hence, it is  subjected to a process called splicing where the introns are removed  and exons are joined in a defined order. hnRNA undergoes  additional processing called as capping and tailing. In capping an  unusual nucleotide (methyl guanosine triphosphate) is added to  the 5*'*-end of hnRNA. In tailing, adenylate residues (200-300) are  added at 3*'*-end in a template independent manner. It is the fully  processed hnRNA, now called mRNA, that is transported out of the  nucleus for translation (Figure 6.11). | | | | 3 |
| **15.** | Objective- to find out which biomolecule is the genetic material(1/2 mark)  DNA is the genetic material-1/2 mark  A-Survives  B-Dies  C-Survives  D-Dies (2 marks)  OR | | | | 3 |
|  | **SECTION -D** | | | |  |
| **16.** | a.  **a sequence of 3 consecutive nucleotides that codes for a specific amino acid**  b.64  c.GCACGAAAGUUU  d.AAA,TTT  e.Any two | | | | 5\*1 |