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MAF-762 Seat No. _____

B. Sc. (Sem. V) Examination

October / November - 2018

Biotechnology : Paper - 502

(Molecular Genetics - CC-I-8)

Time : 3 Hours] [Total Marks : 70

1 MCQ : 15

(1) What is added to the 3'-end of many eukaryotic tRNAs after transcription?

(A) Introns
(B) Cap of modified G nucleotide
(C) Poly A tail
(D) Trinucleotide CCA

(2) Eukaryotic RNA polymerase I is specialized to transcribe which of the following?

(A) mRNA
(B) tRNA
(C) Ribosomal RNA
(D) Mitochondrial RNA

(3) Histones have an abundance of which of the following amino acids?

(A) Lysine and Arginine
(B) Alanine and Glutamine
(C) Glycine and Glutamine
(D) Arginine and Glutamine

(4) The RNA primer is removed from the Okazaki fragment by :

(A) DNA Pol I
(B) DNA Pol II
(C) DNA Pol III
(D) RNA polymerase

(5) How many hydrogen bonds are formed between U and A in a Watson-Crick base pair interactions?

(A) 0 (B) 1

(C) 2 (D) 3

(6) Which of the following is not needed for DNA transcription?

(A) Ribosomes (B) Nucleotides

(C) DNA (D) Enzymes

(7) Which of the following is not true of DNA?

(A) A pairs with T and G pairs with C

(B) Nitrogen bases are 0.34 nm apart on a DNA strand

(C) The double helix is 2.0 nm wide

(D) The double helix is 3.4 nm wide

(8) The triplet code of CAT in DNA is represented as _____ in mRNA and _____ in tRNA.

(A) GAA, CAT (B) CAT, CAT

(C) GUA, CAU (D) GTA, CAU

(9) The X-ray diffraction studies conducted by _____ were key to the discovery of the structure of DNA.

(A) McClintock

(B) Franklin

(C) Meselson and Stahl

(D) Chargaff

(10) Proteins that assist the binding of RNA polymerase to the promoter region on DNA strand are called

(A) Transcription factor

(B) SSB protein

(C) Sigma factor

(D) All of the above

(11) The enzyme which builds a mRNA strand complimentary to the DNA transcription unit is called :

(A) DNA polymerase

(B) RNA polymerase

(C) Helicase

(D) DNA ligase

(12) A gene is a section of DNA that codes for a protein, this unique sequence of bases will code for the production of a unique protein is:

(A) Exon

(B) Intron

(C) Regulatory sequence

(D) None-of these

(13) If you perform a laboratory analysis of DNA, you would find that the amount of adenine is _____ the amount of thymine.

(A) much greater than

(B) much less than

(C) about the same as

(D) no relationship to

(14) In addition of histone protein chromatin contains an approximately equal mass of a wide variety of

(A) Non-histone protein

(B) RNA

(C) Positive charge protein

(D) Unknown protein

(15) The longevity of mRNA is related to:

(A) the length of the poly (A) tail.

(B) the 5' cap on the mRNA.

(C) All of these are correct.

(D) None of these

2 Answer the following : (any **five**) 25

(1) Explain Semi-conservative mode of DNA Replication.

(2) Write a note on The genetic code.

(3) Write a note on DNA Polymerase.

(4) Write a note on Types of RNA Polymerase.

(5) Explain tRNA activation process in Translation process.

(6) Write a note on Enzyme involved in DNA Replication.

(7) Write a note on Telomeric Replication in eukaryotic cell.

3 Answer the following : (any **three**) 30

(1) Explain the Hershey and Chase experiments with diagram.

(2) Explain Protein synthesis process in Prokaryotic cell.

(3) Explain Transcription process in Prokaryotic cell.

(4) Explain Gene Regulation with Example *Lac operon in E. coli.*
