



**GAF-461**

Seat No. \_\_\_\_\_

**B. Sc. (Sem. V) Examination**

November / December - 2015

**Biotechnology : CC - I - 8**

**502 : Molecular Genetics**

Time : 3 Hours]

[Total Marks : 70

1 MCQ : (15)

- 1) "Jumping genes" that have the ability to move within and between chromosomes are called
  - a) introns.
  - b) oncogenes.
  - c) transposons.
  - d) retroviruses.
- 2) A form of gene regulation that occurs while RNA is still in the nucleus is
  - a) differential intron removal and splicing.
  - b) feedback control.
  - c) binding of the repressor protein to DNA.
  - d) enzymatic cleavage of a polypeptide
- 3) Which statement is NOT true about genetic control in prokaryotes?
  - a) RNA polymerase must bind to a promoter on the DNA to begin RNA synthesis.
  - b) Most gene expression is regulated at the level of translation.
  - c) An active repressor protein keeps RNA polymerase from binding to DNA.
  - d) Structural genes produce enzymes that act in a metabolic pathway.
- 4) Which of the following subunits of the bacterial RNA polymerase is responsible for promoter recognition ?
  - a) alpha
  - b) B
  - c) B'
  - d) Sigma

- 5) Which is true of the melting temperature of G-C pairs compared to A-T pairs in DNA?
- The  $T_m$  are equal
  - $T_m$  of G-C is less than the  $T_m$  of A-T
  - $T_m$  of G-C is greater than the  $T_m$  of A-T
  - None of the above
- 6) All of the following are involved in translating information into proteins EXCEPT:
- rRNA
  - siRNA
  - tRNA
  - snRNA
- 7) The following are features of DNA replication EXCEPT :
- Semi-conservative
  - Semi-discontinuous
  - unidirectional
  - chain growth in the 5' → 3' direction
- 8) Which of the following does not have introns?
- DNA
  - Non-processed pseudo genes
  - Processed m RNA
  - Primary RNA transcript
- 9) The enzyme responsible for initiating DNA replication in prokaryotes is:
- DNA polymerase I
  - DNA polymerase III
  - Polymerase beta
  - Primase
- 10) The enzyme responsible for continuing DNA replication in prokaryotes, once it is initiated is:
- DNA polymerase I
  - DNA polymerase III
  - polymerase beta
  - polymerase delta
- 11) Which of the following, one class of RNA characteristically contains unusual purines and pyrimidines. This RNA is
- tRNA
  - rRNA
  - m RNA
  - 16s RNA

- 12) All are nucleosides except
  - a) Cytosine
  - b) Guanosine
  - c) Inosine
  - d) Adenosine
- 13) Which of the following sugar is found in RNA?
  - a) 2-deoxy Ribose
  - b) 3-deoxy Ribose
  - c) D- Ribose
  - d) D-Xylulose
- 14) What is added to the 3'-end of many eukaryotic mRNAs after transcription?
  - a) Introns
  - b) Cap of modified G nucleotide
  - c) Poly A tail
  - d) Trinucleotide CCA
- 15) In protein synthesis which out of the following is not a termination codon ?
  - a) UAG
  - b) UGA
  - c) UUU
  - d) UAA

2 ANSWER THE FOLLOWING. (ANY FIVE) (15)

- 1 Define Replication and Translation.
- 2 Draw the labeled Diagram of prokaryotic DNA Replication
- 3 Define Trasposons and its Draw diagram
- 4 Give one role of each of the following in the production of a protein a) DNA b) tRNA c) mRNA
- 5 Describe complementary base pairing and the bonding that occurs between bases.
- 6 Activation of tRNA in translation process
- 7 Give one role of each of the following in the process of translation. A) DNA B) Ribosome c) RNA

3 ANSWER THE FOLLOWING. (ANY FIVE) (20)

1. Explain Alternative forms of DNA.
2. Write a note on Gene Regulation
3. Write a note on DNA Polymerase
4. Write a note Types of RNA molecules
5. Explain Transposable elements
6. Write a note on RNA polymerase
7. Explain central Dogma process in cell

4 ANSWER THE FOLLOWING. (ANY TWO) (20)

1. Justify DNA as a Genetic material
  2. Explain Protein synthesis process in Eukaryotic cell
  3. Explain Translation process in Prokaryotic cell
  4. Explain DNA Replication in E.Coli
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