



Register Number:.....

B.TECH DEGREE EXAMINATIONS: NOV/ DEC 2014

(Regulation 2009)

Fourth Semester

BIOTECHNOLOGY

BTY 111: Molecular Biology

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

- Which of the following is an accurate statement concerning the differences between DNA and RNA?
 - RNA is usually double-stranded, but DNA is usually single-stranded.
 - RNA has the sugar deoxyribose, but DNA has the sugar ribose.
 - RNA contains three different nucleotides, but DNA contains four different nucleotides.
 - RNA lacks the base thymine (which is found in DNA) and has uracil instead.
- When a bacteriophage infects a bacterial cell, the newly synthesized bacteriophage may acquire bacterial DNA by mistake. If such a newly synthesized bacteriophage then infects a new bacterial cell, it may introduce foreign bacterial DNA into the new cell. This phenomenon is called:
 - Sexual reproduction.
 - Transformation.
 - Transduction.
 - Conjugation
- DNA polymerases
 - Join DNA fragments
 - Replicate RNA
 - Synthesize DNA in 5' → 3' direction
 - Synthesize DNA in 3' → 5' direction
- When DNA is distributed to daughter cells following DNA replication:
 - Both daughter cells contain only newly synthesized, daughter DNA.
 - One daughter cell contains both newly synthesized DNA strands, while the other daughter cell contains both the original, parental DNA strands.

13. Define rolling circle mode of DNA replication.
14. Distinguish Gene and Genome.
15. Write short notes on: a) Initiation codon b) termination codon
16. Compare Polycistronic & Monocistronic mRNA
17. Define Svedberg unit. What is the Svedberg unit of prokaryotic and eukaryotic ribosome?
18. Name any two translation inhibitors.
19. Compare positive & negative regulation.
20. Give the role of three enzymes of Lac-operon.

PART C (5 x 14 = 70 Marks)

- 21 (a) Explain in detail about the three different mechanisms by which bacterial genetic transfer occurs.

OR

- (b) Explain the classical experiments that proved DNA as genetic material.

- 22 (a) Explain the role of telomerase in preventing shortening of chromosomes during DNA replication.

(OR)

- (b) Compare and contrast the organization of prokaryotic and eukaryotic genome.

- 23 (a) Describe the mechanism of transcription in eukaryotes.

(OR)

- (b) Explain the mechanism of splicing of eukaryotic nuclear genes.

24. a) Explain the post-translation modification of proteins.

(OR)

b) Discuss the different steps of translation in prokaryotes.

25 a) What is operon concept? Explain the positive and negative control of gene expression.

(OR)

b) Explain different DNA repair mechanisms and their importance.
