

**M.Sc. BIOTECHNOLOGY
SECOND SEMESTER
MOLECULAR BIOLOGY
MBT – 201**

(Use Separate Answer Scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

[PART-A: Objective]

Time : 20 min.

Marks : 20

Choose the correct answer from the following:

1X20=20

- Which is the second level of organization in DNA packaging?
 - Octamer
 - 30nm fiber
 - 10nm fiber
 - Both b and c
- Which part of heterochromatin has more GC content?
 - Interband
 - Band
 - Both b and c
 - None
- The complex of DNA and histone proteins in the nucleosome is called
 - chromatin
 - chromatid
 - chromomere
 - all
- Which are the transcriptionally active site in polytene chromosome?
 - Dark band
 - Light band
 - Interband
 - All
- What is the repeat size of Microsatellite?
 - 1- 6bp
 - 1-10 bp
 - Both
 - 50 bp
- Who regulates catabolite activator protein in lac operon?
 - Glucose level
 - Lactose level
 - Both
 - None
- Shine dalgarno sequence is found in
 - Bacteria
 - Plants
 - Animals
 - Fungus
- The flow of information from genetic code to protein is mediated by
 - Golgi apparatus
 - Ribosome
 - Lysosomes
 - All are correct
- Where does the methyl group bind to DNA strand?
 - Major groove
 - Minor groove
 - Hydrogen bond
 - All

10. Why lampbrush chromosomes are called so?
- Due to lateral loops
 - Due to balbiani rings
 - Due to chromomeres
 - All
11. There areinitiation factors in bacteria.
- 3
 - 13
 - 4
 - 19
12. The term mutation is thechange in DNA.
- Chronic
 - Random
 - Sudden
 - Slow
13. The enzymes mainly responsible for repair are
- Pol II and Pol III
 - Pol I and Pol III
 - Pol I, Pol II and Pol III
 - Pol I and Pol II
14. The genes where only transcription takes place is
- Pseudogenes
 - Processed pseudogenes
 - Both
 - None
15. Ethidium bromide is an example of.....mutagen
- Chemical
 - Physical
 - Radiation
 - Mutant
16. The amino acids are present at top of tRNA which is mediated by
- tRNA
 - Variable loop
 - Anticodon loop
 - Genetic code
17. Imagine the DNA having no telomere.
- It is circular
 - Circular and double stranded
 - It is linear
 - Circular or exonuclease DNA product
18. Which of the following is present in a nucleosome?
- H2A
 - H2C
 - Both a and b
 - H5
19. The cap in mRNA isbond
- 5'3'
 - 3'5'
 - 5'5'
 - 3'3'
20. Similar sequences which differ in length only are known as
- Repeats
 - Polymorphism
 - Tandem repeats
 - All

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PART-B : Descriptive

Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. How does the abundance or absence of tryptophan in the medium controls attenuation in trp operon? Write briefly about multigene families. 6+4=10
2. Explain negative and positive regulation of lac operon with proper diagrams. 10
3. a. Write 4 differences between lampbrush and polytene chromosome. 4+6=10
b. Explain the structure of nucleosome and chromatin fiber with diagram.
4. Explain the Watson and Crick model of DNA? What is difference between ribose and deoxyribose sugar. 7+3=10
5. Write the mechanism of replication process with indicating the functions of enzymes involved in the process. 10
6. What is transcription? Explain the mechanism of transcription in prokaryotes. 2+8=10
7. Explain the process of central dogma? Write a note on translation initiation in bacteria. 3+7=10
8. Explain histone acetylation and deacetylation with diagrams. Enumerate how DNA hypermethylation and cancer is linked. 6+4=10

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