Enrollment No._____

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Science
Program/s: Biomedical Science
Year: 2nd **Semester:** 3rd
Examination: End Semester Examination
Examination year: December - 2021

Course Code: BM203 **Course Name:** Molecular Biology-II
Date: 06/12/2021 **Total Marks:** 40
Time: 08:30 am to10:30 am **Total Pages:** 02

Instructions:

- *Write each session/answer on a new page.*
- *Use of a calculator is permitted/not permitted:NA*
- *Any other relevant instructions if any: Provide neat and clean diagram wherever necessary.*

Q. No.	Details	Marks	CO	BTL
Q.1	**A. Choose the correct answer.** (5 x 1) 1. The part of DNA coding for a protein is: a. Gene b. Allele c. Genome d. Cistron 2. One of the nucleotides in a genic segment of DNA underwent a mutation: a. Point mutation b. Pseudogene c. Polymorphism d. Missense mutation 3. With reference to human genome a. 98% of DNA is non-coding b. 50% of DNA is mobile elements c. 3% of DNA is simple repeats d. All are true 4. Splicing in prokaryotes is specifically observed in a. rRNA genes b. tRNA genes c. all genes expressing proteins d. All of the above 5. The nucleophilic attack triggering the initiation of splicing is initiated by a. 3' Guanine b. 5' Guanine c. Adenine at branch point site d. None of the above **B. Identify the below statements as True or False. If the answer is False, change the underlined word(s) to make the statement true.** (5 x 1) 1. The sugar found in RNA is called deoxyribose. 2. The DNA molecule is double stranded and the RNA molecule is single stranded. 3. The process of translation occurs at the ribosome. 4. The job of mRNA is to pick up amino acids and transport them to the ribosomes. 5. Transcription must occur before translation may occur.	10	CO1 CO2 CO3	BT1 BT2

Q.2 **Explain in brief.** Any 5 | 10 (2 x 5) | CO1 CO2 CO3 | BT1 BT2

1. What is a cryptic gene?
2. What are translation factors?
3. What do you understand by degeneracy of genetic code?
4. Write a short note on Genetic Code and its unique properties.
5. Differentiate between monocistronic and polycistronic mRNAs.
6. Explain C value paradox.
7. What are non-coding RNAs? Enlist non-coding RNAs found in organisms.
8. Enlist the types of RNA polymerases found in eukaryotes with their respective significance.

Q.3 **Match A with B and C** | 10 | CO1 CO2 CO3 | BT1 BT2

	A	B	C
1	Prokaryotic gene promoter	Poly U site	Transcriptional elongation
2	RNA splicing	Hairpin loop strcture	holoenzyme
3	Apoenzyme	Consensus sequence	Precursor rRNA and tRNA
4	RNA processing	Phosphorylation	Rho-independent termination
5	Non-coding RNAs	Trans-esterification	RNA-interference
6	Eukaryotic gene promoter	Sigma factor	Pribnow box
7	Spliceosome	Methylation	Rho-dependent transcription termination
8	C-terminal domain	RNA:protein complex	Self-splicing
9	Prokaryotic transcription termination	Gene-expression regulation	TATA binding protein
10	RNA:DNA helicase activity	TATA box	small nuclear ribonucleoproteins (snRNPs/snurps)

Q.4 **Explain in detail. (Provide figures if necessary)** Any 2 | 10 (5 x 2) | CO1 CO2 CO3 | BT1 BT2

1. Explain eukaryotic gene organization
2. Explain the organization of lac operon.
3. Describe in detail the process of protein synthesis in prokaryote and Eukaryote.
4. Describe the process of self-splicing.

**********End of Question Paper**********