



**NAVVRACHANA
UNIVERSITY**

a UGC recognized University

School: School of Science
Program/s: BSc Microbiology
Year: 3rd **Semester:** 5th
Examination: End Semester Examination
Examination year: Dec 2022

Course Code: LS304 **Course Name:** Molecular Biology and Microbial genetics

Date: 6/12/2022

Total Marks: 40

Time: 2:30 Pm to 4:30 Pm

Total

Pages: 2

Instructions:

- All questions are compulsory
- Draw neat labelled diagram wherever required
- * COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	COs*	BTL#
Q.1	Do as Directed	8		
	1) A circular piece of DNA that can replicate independently of the bacterial chromosome or integrate and replicate as part of the chromosome by homologous recombination is (choose the correct option)			
	a) Episome b) Rolling circle c) Theta mode d) Hfr			
	2) A process by which bacteria uptake DNA from the environment is (Choose the correct option)		CO1, CO2, CO3, CO4	BT1, BT2, BT3
	a) 'Transduction' b) Transformation c) Conjugation d) Transposon			
	3) One of the functions of plasmid is (Choose the correct option)			
	a) Protein synthesis b) DNA replication c) Cell wall synthesis d) None of the above			
	4) What is okazaki fragment and where can it be located?			

- 5) How many nonsense codons are there and name them?
- 6) The transcription initiation factor associated with the RNA polymerase holoenzyme in prokaryotes is _____.
- a. β b. μ c. α d. σ
- 7) If the sequence of bases in DNA is TACCGACCA, then the sequence of codons on the transcript will be _____
- a. ATGGCTGGT
b. ATCCGAACU
c. AUGGCUGGU
d. AUGGACUAA
e. TACCGACCA
f. TUCCGUCCU
- 8) The complex of RNA polymerase, DNA template and new RNA transcript is called translation bubble. True or False and justify

Q.2 Answer the following questions in brief (2*6= 12 M)

12

CO1, BT1,
CO2, BT2,
CO3, BT3
CO4

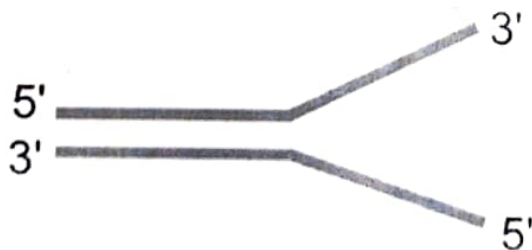
- 1) Who discovered conjugation and in which year?
- 2) What is a minimal medium?
- 3) What is an auxotroph?
- 4) Differentiate between B DNA and Z DNA.
- 5) What is the basis for the difference in the synthesis of the leading and lagging strand of DNA molecules? DNA polymerase can join new nucleotides only to the 3' end of the growing strand.
- 6) *Genetic code is 'universal'*. Comment on the sentence

Q.3 Answer the following questions in detail (4*5= 20 M) (any 4)

20

CO2 BT3,
BT4

- 1) Can prototrophs appear if two auxotrophic strains are grown together in a medium supplemented with the deficient factors of both strains? If yes, how can you identify and separate them?
- 2) The genetic mechanisms in bacteria are said to represent horizontal transfer. What is meant by that? Explain
- 3) Discuss the process of activation of amino acids, formation of initiation complex and elongation of the polypeptide chain in prokaryotes.
- 4) From their examination of the structure of DNA, what did Watson and Crick infer about the probable mechanism of DNA replication, coding capability and mutation?
- 5) A) Identify the figure given below:



B) Redraw the structure and label the parts

C) Write the source of energy for this process and name the enzyme involved in this process.

D) Mention the differences in the synthesis of protein, based on the polarity of the two template strands.

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