

MANIPAL INSTITUTE OF TECHNOLOGY

III SEMESTER B.TECH. (BIOTECHNOLOGY)

MAKE UP EXAMINATIONS, NOV/DEC 2016

SUBJECT: CELL AND MOLECULAR BIOLOGY [BIO 2101] REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.

1A.	Measurements of the amount of DNA per nucleus were taken on a large number of cells from a growing fungus. The measured DNA levels ranged from 3 to 6 picograms per nucleus. In which stage of the cell cycle did the nucleus contain 6 picograms of DNA? Elaborate on this stage of the cell cycle.	4M
1B.	What is meant by protein tagging and what is the significance of this process?	3M
1C.	What is the significance of membrane proteins?	3M
2A.	You came to know that human fibroblast growth factor (FGF) has huge commercial importance and you decided to produce it in large amounts. Explain how you can produce human FGF using a bacterial system.	4M
2B.	Griffith worked with <i>Streptococcus pneumonia</i> . He injected mice with different types of this bacteria. For the following bacteria types injected, state with reason whether the mice lived or died: a) type IIIS b) type IIR + heat-killed IIIS	3М
2C.	How does lysosome protect itself from its own enzymes?	3M
3A.	Briefly outline the concept of a eukaryotic transcription factory.	4M
3B.	Describe the principal difference of cap-dependent initiation of translation in eukaryotes and initiation of translation in bacteria?	3M
3C.	What is the basis for the difference in how the leading and lagging strands of DNA molecules are synthesized?	3M
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4A.	What is RNAi ? How can RNAi be used to treat Alzheimer's disease?	4M	
4B.	How do siRNA differ from miRNA?	3M	
4C.	What are internal ribosomal entry sites?	3M	
5A.	Describe in detail 2 posttranslational modifications that facilitate binding functions of proteins.	4M	
5B.	Why is it important to be careful working with Ethidium bromide in labs?	3M	
5C.	5-bromouracil (5BU) is an analog of thymine. Does 5BU have the potential to give rise to mutations during DNA replication? Justify your answer.	3M	