Printed Page:- Subject Code:- AMTBT0101

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

M.Tech

SEM: I - THEORY EXAMINATION (2021 - 2022)

Subject: Applied Biochemistry & Molecular Biology

Time: 03:00 Hours Max. Marks: 70

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 4 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 7 marks each.
- No sheet should be left blank. Any written material after a Blank sheet will not be evaluated/checked.

SECTION A 15

1. Attempt all parts:-

1-a. What is the value of ΔG when a system is in equilibrium? (CO1) 1

1. $\Delta G = 0$
2. $\Delta G = 1$
3. $\Delta G = -1$
4. $\Delta G = \Delta G^{\circ}$

1-b. An isomerase: (CO2) 1

1. rearranges groups within a molecule
2. joins two molecules together using energy from ATP
3. transfers part of one molecule to another molecule
4. removes a group from a molecule forming a double bond or adds a group to a double bond

1-c. How many RNA polymerases are present in a bacterial system? (CO3) 1

1. 4
2. 2
3. 1
4. 3

1-d. In mismatch repair mechanism, the endonuclease activity which cut the nascent DNA strand is done by: (CO4) 1

1. MutH
2. MutL
3. MutS
4. UvrD

1-e. The synthesis of polynucleotide chain of mRNA is catalyzed by the enzyme _____ (CO5) 1

1. RNA helicase

2. RNA polymerase
3. DNA polymerase
4. DNA helicase

2. Attempt all parts:-

2-a.	What are different structures of amino acids? (CO1)	2
2-b.	Name two different cellular functions that require energy. (CO2)	2
2-c.	What compound receives electrons from NADH? (CO3)	2
2-d.	What is histone methylation? (CO4)	2
2-e.	What are the template and coding strands of DNA? (CO5)	2

SECTION B 20

3. Answer any five of the following:-

3-a.	Describe the structural basis of the lipid class called eicosanoids. (CO1)	4
3-b.	What are the four levels of protein structure? Explain the bonds formed in each level. (CO1)	4
3-c.	What are the difference between an anabolic and catabolic pathways? (CO2)	4
3-d.	What do you understand by phosphoryl group transfer? (CO2)	4
3-e.	How urea is formed in the body? (CO3)	4
3-f.	Describe the bonding patterns within cyclic nucleotides. (CO4)	4
3-g.	What are the three important features of the lac operon? (CO5)	4

SECTION C 35

4. Answer any one of the following:-

4-a.	Explain different classes of proteins with suitable examples. (CO1)	7
4-b.	Explain various factors affecting enzyme activity. (CO1)	7

5. Answer any one of the following:-

5-a.	Describe the position of the transition state on a vertical energy scale, from low to high, relative to the position of the reactants and products, for both endergonic and exergonic reactions. (CO2)	7
5-b.	Plants must have adequate resources to complete their functions. If they do not have what they need, there are changes in the organism's metabolism. Predict the effects on the metabolism of a plant that is deprived of adequate sunlight. (CO2)	7

6. Answer any one of the following:-

6-a.	Describe and compare type I, type II, and gestational diabetes. (CO3)	7
6-b.	Identify the initial reactant and final products of the citric acid cycle; explain how this pathway is controlled. (CO3)	7

7. Answer any one of the following:-

7-a.	Understand and explain transcription and how RNA polymerase is involved in the transcription process. (CO4)	7
7-b.	Describe the process of circular DNA replication. (CO4)	7

8. Answer any one of the following:-

8-a.	Compare and contrast the actions of DNA and RNA polymerase. (CO5)	7
8-b.	Describe the structure of DNA. Support your answer with a labelled diagram. (CO5)	7