Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **M.Sc.I**
FCYE805

8th Semester Regular Examination: 2024-25
Chemical Biology
BRANCH(S): M.Sc.I(AC)
Time: 3 Hours
Max Marks: 70
Q.Code: S188
Answer Question No.1 (Part-I) which is compulsory, any five from rest (Part-II)
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions :** **(2 x 10)**

a) Write the name and structure of three reagents used for sequencing of proteins.
b) Write the structure of omega-3-fatty acid and chemical name of it.
c) Briefly explain the types and functions of RNA.
d) What is FAD? Draw its structure.
e) Write the chemical name and structure of sucrose.
f) How many ATP are produced in the glycolysis pathway? Write the net chemical reaction.
g) Define genome.
h) An α-helix consists of 100 amino acids. Determine its length.
i) What do you mean by phosphorylation?
j) Glutamate has three pKs i.e. 1.97, 3.20, and 8.17. Determine its pI.

Part-II

Long Answer Type Questions (Answer Any five)

Q2 **a)** What is Kreb's cycle? Describe each step of conversion in a TCA cycle. **(6)**

b) Describe the detail structure of starch and its properties. **(4)**

Q3 **a)** Discuss the secondary structures of proteins. **(6)**

b) What are hormones? Discuss the classifications and functions of steroid hormones. **(4)**

Q4 **a)** In biological system glucose is converted to pyruvate. Discuss each step of conversion of this process. **(6)**

b) Discuss the general principle followed in sequencing the amino acids in a protein. **(4)**

Q5 **a)** Write the 3-letters, one letter and name of twenty (20) naturally occurring amino acids. How are they classified based on their properties? Write the names of amino acids in each category. **(6)**

b) Enumerate the importance of Ramachandran plot in determining the protein structures. **(4)**

Q6	**a)**	Derive the rate equation for enzyme kinetics. Discuss the significance of Michaeli-Menten's constant.	**(7)**
	b)	Two DNA samples are collected from two species of bacteria, X and Y, adenine makes up 30% and 20%, respectively. One of these species was isolated from a hot spring (80^{o}C). Which species is most likely the thermophilic bacterium and why?	**(3)**
Q7	**a)**	Write the classifications of lipids. Draw the structure of sphingolipids with the head group substitution as glucose.	**(7)**
	b)	Write all the possible structures of glucose.	**(3)**
Q8	**a)**	Define DNA. Give a brief account on double helical structures of DNA.	**(6)**
	b)	Write the names of fat soluble vitamins. Describe the chemical name and structures of any two fat soluble vitamins. Describe the diseases caused due to deficiencies of these vitamins.	**(4)**