

[16]

SEAT No. \_\_\_\_\_

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SARDAR PATEL UNIVERSITY

B.Sc.(5<sup>th</sup> Semester) EXAMINATION 2019

Tuesday, 9<sup>th</sup> April, 09/04/2019

10:00 a.m. TO 1:00 p.m.

SUBJECT: MICROBIOLOGY US05CMIC03

(Microbial Physiology and Enzymology)

TOTAL MARKS: 70

- Note: (1) All the questions are compulsory.  
(2) Figures on the right indicate marks.

**Q-1** Select the correct answer for each question from the option given below [10]

1. In sodium-Potassium pump \_\_\_\_\_ Na<sup>+</sup> and \_\_\_\_\_ K<sup>+</sup> are exchanged across the membrane.  
(A) 1 & 1 (B) 2 & 2 (C) 3 & 2 (D) 3 & 3.
2. A short sequence of amino acid located on the N-terminus of a protein is called \_\_\_\_\_.  
(A) Strong peptide (B) Signal peptide (C) Single Peptide (D) Special peptide
3. Which of the following is a fungicidal antibiotic?  
(A) Streptomycin (B) Vancomycin (C) Acyclovir (D) Amphotericin B
4. Which of the following antibiotic structurally resembles to D-alanyl D-alanine moiety of bacterial cell wall?  
(A) Penicillin (B) Streptomycin (C) Vancomycin (D) Bacitracin
5. Those enzymes which are involved in the intramolecular transfer of the functional groups belong to which of the following major class of enzymes?  
(A) Oxidoreductase (B) Transferase (C) Lyase (D) Isomerase
6. Inactive precursors of enzymes are known as \_\_\_\_\_.  
(A) Zymogen (B) Isoenzyme (C) Apoenzyme (D) Synzyme
7. In which type of enzyme inhibition K<sub>m</sub> increases but V<sub>max</sub> does not change?  
(A) Allosteric (B) Competitive (C) Noncompetitive (D) Uncompetitive
8. Activation of Glycogen Phosphorylase in liver takes place through which of the following mechanism of covalent modification?  
(A) Acetylation (B) Adenylation (C) Phosphorylation (D) Methylation
9. Carboxylation reactions catalyzed by carboxylases require which of the following as their co enzyme?  
(A) Niacin (B) Biotin (C) Pyridoxine (D) Riboflavin
10. Acyclovir is a structural analog of which of the following?  
(A) Deoxyadenosine (B) Deoxythymidine (C) Deoxyguanosine (D) Deoxycytosine

**Q-2** Give Short answers to following questions (Any ten) [20]

- [1] Draw neat and labeled diagram of fluid mosaic model of Singer and Nicholson.
- [2] Differentiate between active and passive transport.
- [3] Define symport and antiport.
- [4] How pathogenic bacteria develops resistant against penicillin and streptomycin?
- [5] Write about the mode of action of polymixin.
- [6] Enlist various target sites or biochemical systems affected by chemotherapeutic agents?

(1)

(P.T.D)

- [7] Define (a) Active site (b) Isoenzyme
- [8] Write about stereospecificity and reaction specificity of enzymes.
- [9] Enlist various strategies for the purification of enzymes.
- [10] Define (1)  $K_m$  (2) Specificity constant
- [11] Draw Double reciprocal plot and write about its significance.
- [12] Write about Ping-Pong mechanism of Multisubstrate enzyme catalyzed reaction.

- Q-3 (A) Write a brief note on- Group translocation [05]  
 (B) Write a note on- Siderophores [05]

OR

- Q-3 (A) Write a note on- Na-K Pump [05]  
 (B) Define diffusion-What are the factors affecting the rate of diffusion and enlist the dissimilarities of facilitated to passive diffusion. [05]

- Q-4 (A) Discuss about mode of action of the following: [06]  
 (a) Chloramphenicol, (b) Penicillin (c) Acyclovir  
 (B) Discuss the mechanism of flagellar movement in detail [04]

OR

- Q-4 What is endospore? Discuss the mechanism of sporulation in detail. [10]

- Q-5 Prove with suitable experimental evidences that Ornithine Phosphoribosyl transferase and Ornithine monophosphate decarboxylase activities are associated with single polypeptide chain of UMP synthase. [10]

OR

- Q-5 Write detail note on- Factors affecting rate of enzyme catalyzed reaction. [10]

- Q-6 (A) Explain mechanism of reversible enzyme inhibition with neat and labeled characteristic plots and enzyme kinetics. [05]  
 (B) Write a note on- Characteristics of allosteric enzymes [05]

OR

- Q-6 Explain quantitative relationship between initial velocity ( $V_o$ ), maximum velocity ( $V_{max}$ ) and substrate concentration  $[S]$  by using different assumptions. [10]

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 (2)