

(i) Printed Pages: 3

Roll No.

(ii) Questions : 9

Sub. Code :

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Exam. Code :

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B.A./B.Sc. (General) 2nd Semester

(2042)

BIO-CHEMISTRY

Paper—B : Enzymes and Bioenergetics

Time Allowed : Three Hours]

[Maximum Marks : 45

Note :— Attempt *five* questions in total including Question 1, which is compulsory. Attempt *one* question from each of the Unit I to Unit IV.

I. Compulsory question. Answer each in 3-4 lines :

- (i) What is a prosthetic group ? Give a suitable example.
- (ii) What is the function of Co-A in biosynthetic pathways ?
- (iii) What is K_{cat} ?
- (iv) What is turnover number of an enzyme ?
- (v) Write chemical structure of FAD.
- (vi) What is K_m and its significance ?
- (vii) What are hydrolases ? Give suitable examples.
- (viii) What is end-product inhibition ?
- (ix) How CO (carbon monoxide) inhibits the ETC ?

1×9=9

UNIT—I

- II. (a) What are isozymes ? Describe their properties and important biological functions.
- (b) What are zymogens ? Explain their importance in clinical diagnostic studies.
- (c) What is an apoenzyme ? Explain with suitable example. 4,3,2
- III. (a) Describe IUB system of classification of enzymes by referring major biological functions of each class.
- (b) What are coenzymes ? Describe important functions of NAD and FAD in bioenergetics pathways.
- (c) What are dehydrogenases ? Describe their importance in glycolytic pathway. 4,3,2

UNIT—II

- IV. (a) What are monomeric enzymes ? How their activities are influenced by dietary factors ?
- (b) What are multimeric enzymes ? Explain their properties and functions with suitable examples.
- (c) What is a non-specific protease ? Explain the mechanism of enzymatic action of chymotrypsin. 4,3,2
- V. (a) What are oligomeric enzymes ? Describe their important properties and major biological functions. 3
- (b) Write short notes on any *two* of the following :
- (i) Theory of enzyme catalysis
- (ii) Acid-base catalysis
- (iii) Alkaline proteases. 3×2=6

UNIT—III

- VI. (a) What is Michaelis-Menten equation and its limitations, if any ?
- (b) What is a competitive enzyme inhibitor ? Explain with suitable example(s).
- (c) What is feedback inhibition ? How it can be overcome ? 4,3,2
- VII. (a) What are metabolic inhibitors ? Describe their importance in medical sciences.
- (b) What is K_i ? How it is determined ?
- (c) What is V_{max} ? How it can be enhanced ? 4,3,2

UNIT—IV

- VIII. (a) What are redox agents ? Enlist any three of these and describe their functions. 5
- (b) What are major biological functions of FAD/FADH in thermodynamic reactions ? 4
- IX. (a) What are phosphate-rich compounds ? Describe their role in bioenergetics reactions. 3
- (b) Write short notes on any *two* of the following :
- (i) Enthalpy
- (ii) Oxidative phosphorylation
- (iii) Exergonic reactions. 3×2=6