

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 1135 E Your Roll No.....

Unique Paper Code : 253401

Name of the Course : B.Sc. (Hons.) Microbiology

Name of the Paper : Microbial Physiology and Metabolism II [MIHT-406]

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all.
3. All questions carry equal marks.
4. Attempt all parts of a question together.

1. (a) Define any five of the following :

- (i) Amphibolic pathway
- (ii) Specific activity of an enzyme
- (iii) Lyases
- (iv) Substrate level phosphorylation
- (v) Redox potential
- (vi) Azoferrodoxin
- (vii) Prosthetic group

(2×5=10)

P.T.O.

(b) Give an example of any five of the following :

(i) Cytochrome oxidase inhibitor

(ii) Free living anaerobic nitrogen fixer

(iii) Irreversible enzyme inhibitor

(iv) Butyric acid fermenter

(v) Electron carrier

(vi) Multienzyme complex

(1×5=5)

2. Write short notes on (any 3) :

(i) Allosteric enzymes

(ii) Oxidative decarboxylation of pyruvate

(iii) Glyoxylate cycle and its significance

(iv) Biochemistry of nitrogen fixation

(3×5=15)

3. Differentiate between any 3 of the following :

(i) Heterofermentative and Homofermentative lactic acid production

(ii) Assimilatory and Dissimilatory nitrate reduction

(iii) Glycolysis and Gluconeogenesis

(iv) Competitive and Non-competitive enzyme inhibition

(3×5=15)

4. (a) Describe the ED pathway of glucose catabolism in bacteria.

(5)

(b) Describe the Induced fit hypothesis of enzyme catalysis.

(4)

**OR**

Explain Pasteur effect.

(c) Write the complete balanced reaction catalysed by the following enzymes **(any 4)** :

(i) Isocitrate dehydrogenase

(ii) Transaldolase

(iii) Phosphoketolase

(iv) Catalase

(v) Enolase

(1.5×4=6)

5. (a) Write the contributions of **any 2** of the following scientists :

(i) Michelis and Menten

(ii) O. Warburg

(iii) J. B. Sumner

(2.5×2=5)

(b) How is ATP synthesised during the electron transport chain ? (6)

**OR**

Differentiate between bacterial and mitochondrial ETC.

(c) Explain isozymes with the help of a suitable example. (4)

6. (a) Explain any three mechanisms that nitrogen fixers adopt to prevent oxygen toxicity of nitrogenase enzyme. (6)

(b) What is the significance of oxidative pentose phosphate pathway in cellular metabolism ? (5)

*P.T.O.*

**OR**

TCA cycle is an amphibolic pathway. Justify.

- (c) Name three enzymes that regulate the EMP pathway. (3)
- (d) Give an example of alcohol producing bacteria. (1)