G-3/381/22

Roll No. .....

III Semester Examination, January 2022

M.Sc.

MICROBIOLOGY

Paper I

(Microbial Physiology)

Time : 3 Hours] [Max. Marks : 80

Note : *All questions are compulsory. Question Paper comprises of 3 Sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.*

SECTION A **1×8=8**

(Objective Type/Multiple Choice Questions)

Choose the correct answer :

1. Where are bacteriochlorophyll present in the cell ?

(a) Chloroplast

(b) Mitochondria

(c) Membrane

(d) Nucleoid

P.T.O.

2. Which of the following steps during electron transfer in anoxygenic photosynthesis is the ATP production step ?

(a) Ubiquinone to Cyt b

(b) Ferredoxin to Ubiquinone

(c) Cyt b to Cyt f

(d) Cyt b to Bacteriochlorophyll

3. Which of the following amino acid is both glucogenic and ketogenic in nature ?

(a) Leucine (b) Lysine

(c) Isoleucine (d) Histidine

4. Arginine is synthesized from which of the following compound ?

(a) Lysine (b) Citrulline

(c) Lactate (d) Histimine

5. Which of the following enzyme is not involved in galactose metabolism ?

(a) Glucokinase

(b) Galactose-1-Phosphate Uridyl transferase

(c) Galactokinase

(d) UDP-Galactose 4-epimerase

6. Which of the following is the final electron acceptor in lactic acid fermentation ?

(a) Lactic acid (b) Pyruvate

(c) Oxygen (d) NAD

7. How many molecules of ATP are hydrolysed to form two molecule of ammonia ?

(a) 5 (b) 10

(c) 15 (d) 16

8. Which of the following bacteria genus is capable of oxidizing ammonia (NH_4) ?

(a) Nitrospina (b) Nitrobacter

(c) Nitrosococcus (d) Nitrosobacter

SECTION B **6×4=24**

(Short Answer Type Questions)

Note : *Answer the following questions in* ***250*** *words.*

Unit-I

1. What do you mean by Photosynthetic apparatus ? Precisely comment on the organization of Photosynthetic apparatus in Cyanobacteria.

Or

What is Photo-phosphorylation ? Illustrate the halobacterial photophosphorylation in brief.

Unit-II

2. What are the features of Techoic acid ? Discuss the biosynthesis of teichoic acid and its significance in bacteria.

Or

Write a concise account of Microbial metabolism of hydrogen.

Unit-III

3. Write a concise account of the mechanism involves for the Transport of nutrients across membrane and point out its significance in microbes.

Or

What are Electron acceptors ? Citing the Sulphur compounds as electron acceptors, illustrate the electron transport system in SO_4 reducers.

Unit-IV

4. What is Steriod ? Write in brief about the bio-transformation of steroid and non-steroid compounds.

Or

Write a concise account of the properties and regulation of Glutamine synthetase and Glutamate synthetase.

SECTION C **12 × 4 = 48**

(Long Answer Type Questions)

Note : *Answer the following questions in* ***500*** *words.*

Unit-I

1. What do you mean by Microbial photosynthesis ? Give a critical account of light harvesting and electron transport system and the mechanism of ATP synthesis.

Or

Write an illustrated account of the development of photosynthetic apparatus and carbon metabolism in eubacterial photosynthetic microbes.

Unit-II

2. What are essential amino acids ? Discuss the biosynthesis and degradation of any *two* essential amino acids.

Or

What is aromatic compound ? Write a concise account of the microbial degradation of aromatic, polycyclic and halogenated aromatic compounds.

Unit-III

3. What are Methane and Methanol users ? Give a critical account of the aerobic metabolism of Methane and Methanol.

Or

What do you mean by anaerobic metabolism of Glucose ? Briefly discuss the modes of glucose fermentation into lactic acid, acetone and butanol.

Unit-IV

4. What do you mean by Nitrogen fixation ? Why is it essential in nature ? Discuss the mechanism of biological nitrogen fixation in different microbes.

Or

Write a critical account of :

(i) Biochemistry of Methanogenesis

(ii) Ammonia assimilation and its significance in nature

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