

D-6823

M.Sc. (IInd Semester) Examination, 2020

MICROBIOLOGY

(Microbial Physiology and Metabolism)

Time Allowed : Three Hours

Maximum Marks : 70

SECTION - A

(Objective Type Questions)

Note : Attempt any ten questions. Each question carries one mark. **10×1=10**

Q. 1. Fill in the blanks :

- (i) The first product of glycogenolysis is _____.
- (ii) The organism which obtain their energy from chemicals are designated as _____.
- (iii) Triacylglycerol packed with the apolipoprotein and cholesterol in lipoprotein aggregate is called _____.

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(2)

- (iv) The compound that enters the TCA cycle from glycolysis is _____.
- (v) Serine, threonine and tyrosine residues are all subjected to phosphorylation in various signaling pathways. (True / False)

Multiple choice :

- (vi) In the exponential phase, the cells and cell mass :
 - (a) First increases then decreases
 - (b) Decreases
 - (c) Are constant
 - (d) Double at a constant rate
- (vii) The first intermediate with a complete purine ring is _____:
 - (a) Inosinate
 - (b) Formate
 - (c) Aspartate
 - (d) Glycine

(3)

(viii) Which of the following enzyme is not used in

the synthesis of triacylglycerol ?

- (a) Glycerol 3-phosphate acyltransferase
- (b) Acylglycerophosphate acyltransferase
- (c) Phosphatidic acid phosphohydrolase
- (d) Glycogen phosphorylase

(ix) Which of the following is energy independent ?

- (a) Active transport
- (b) Primary active transport
- (c) Secondary active transport
- (d) Passive transport

(x) Pyruvate is the precursor for :

- (a) Alanine
- (b) Glutamate
- (c) Serine
- (d) Proline

(4)

(xi) In the synthesis of pyrimidine

deoxyribonucleotides (dCTP, dTTP) the role of glutamine is :

- (a) a source of aspartate for the pyrimidine ring
- (b) a source of nitrogen for the pyrimidine ring
- (c) a source of carbon for the pyrimidine ring
- (d) a source of nitrogen and carbon for the pyrimidine ring

(xii) Which one of the following enzymes use

NADP as coenzyme ?

- (a) Glyceraldehyde 3 phosphate dehydrogenase
- (b) Lactate dehydrogenase
- (c) Glucose 6 phosphate dehydrogenase
- (d) Beta hydroxyacyl CoA dehydrogenase

(5)

SECTION - B

(Very Short Answer Type Questions)

Note : Attempt any five questions. Each question carries
2 marks. Maximum word limit 25-30 words. **5×2=10**

- Q. 2.** (i) Why glycolysis is not oxygen dependent ?
(ii) What is biofilm ?
(iii) What is differential media ?
(iv) What is substrate level phosphorylation ?
(v) Explain stringent response.
(vi) What is Arc regulon ?
(vii) What are the functions of ABC transporters ?

SECTION - C

(Short Answer Type Questions)

Note : Attempt any five questions. Each question carries
4 marks. Maximum word limit 250 words. **5×4=20**

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(6)

- Q. 3.** (i) Describe how amino acids are transported ?
(ii) Describe the net yield of ATP and NADH from glycolysis.
(iii) Write a note on pyrimidine biosynthesis.
(iv) How lipid composition of bacterial membrane can identify bacteria ?
(v) How do you calculate microbial growth ?
(vi) Explain the role of microorganism in PHA degradation.
(vii) Write a note on FNR regulon.

SECTION - D

(Essay Type Questions)

Note : Attempt any three questions. Each question
carries 10 marks. Maximum word limit 500
words. **3×10=30**

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(7)

- Q. 4.** (i) Explain the biosynthesis and degradation of lipids by microorganisms.
- (ii) What is quorum sensing ? Describe A and C signaling system.
- (iii) Why is glyoxylate cycle important ? How acetyl - CoA is converted to succinate ? How many ATP are produced in glyoxylate cycle ?
- (iv) Define generation time. Explain several methods used to determine viable and total cell counts in populations undergoing exponential growth.
