

(b) Write the biochemical reactions for the following enzymes : (2×4=8)

(i) Rubisco

(ii) Transketolase

(iii) Pyruvate decarboxylase

(iv) Lactate dehydrogenase

6. (a) Discuss the Barker scheme. Describe the experimental evidence given to prove that the process of methane formation is coupled to ATP synthesis. (5+5=10)

(b) Giving suitable examples, describe in brief various physiological groups of aerobic chemolithotrophs. (8)

(200)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4103 H

Unique Paper Code : 2532012402

Name of the Paper : Microbial Physiology and Metabolism-II

Name of the Course : Microbiology

Semester : IV Part-II

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All questions carry equal marks.
3. Attempt any five questions.

1. (a) Give one example for the following (any four) : (1×4=4)

(i) Alcohol producing bacteria

(ii) Denitrifying bacteria

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- (iii) Heterolactic acid fermenting microbe
 - (iv) Methylophilic methanogen
 - (v) A mixotroph
- (b) Discuss the conditions in which a microorganism will carry out dissimilatory nitrate reduction. What are the different processes of dissimilatory nitrate reduction, explain with the help of suitable example. (3+9=12)
- (c) Describe Hill reaction. (2)
2. (a) Mention the types of hydrogenases present in hydrogen oxidizers. Describe their functions. Give suitable diagram/s. (6)
- (b) Explain reverse electron transfer. (3)
- (c) Give the contributions of the following scientists (any three): (3×3=9)
- (i) Calvin, Benson and Bassham
 - (ii) Kjeldhal
 - (iii) Robert Emerson
 - (iv) Carnahan and collaborators

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3. Write short notes on the following (any three): (6×3=18)
- (a) Carbon fixation in Chlorobiaceae
 - (b) Biochemistry of nitrogen fixation
 - (c) Alcohol production in yeast
 - (d) Production of cellular carbon in methanogens
4. (a) Differentiate between the following (any three): (5×3=15)
- (i) Linear and branched fermentative pathways.
 - (ii) Cyclic and non-cyclic photophosphorylation.
 - (iii) Assimilatory Nitrate reduction and ammonia assimilation.
 - (iv) Photosynthetic apparatus in green bacteria and cyanobacteria.
- (b) Describe Pasteur effect. (3)
5. (a) What are the different classes of phototrophic microorganisms? Give their examples and differentiate them on the basis of H-donor, BChl, carbon source and growth conditions. (10)

P.T.O.