

PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
B.Sc. Winter 2017-18 Examination

Semester: 5

Subject Code: 11101304

Subject Name: Microbial Metabolism

Date: 26/12/2017

Time: 2:00pm to 4:30pm

Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

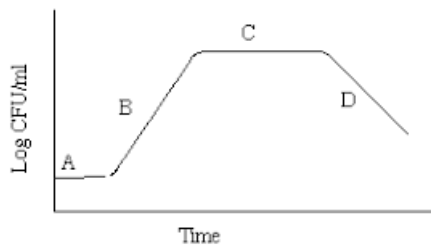
Q.1. A) Brief note. (4x2) (Each of 04 marks) (08)

- (a) Describe the Passive transport in microbes.
- (b) What are the different ways to measurement of cell numbers?

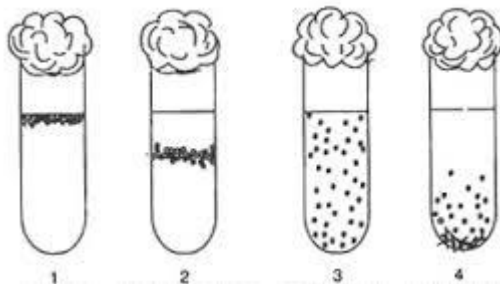
Q.1. B) Answer the following questions. (Any two)

(a) Schematically label the figures (2x2) (Each of 02 marks) (04)

1. Label A,B,C and D in the given diagram



2. Label type of microorganism on the basis of their oxygen requirement in tubes 1, 2, 3 and 4 in the given diagram



- (b) Describe the Tricarboxylic Acid Cycle diagrammatically. (04)
- (c) Write briefly on iron uptake by microorganisms. (04)

Q.2. A) Answer the following questions.

(a) Brief note (Each of 02 marks) (04)

1. Name the different nutritional types of microorganisms?
2. What is the function of Fe and Zn in microbial nutrition?

(b) Describe the Calvin cycle with labeled diagram. (04)

Q.2. B) Answer the following questions. (Any two)

(a) Multiple choice questions. (Each of 01 marks) (03)

1. Which of the following occurs in both photosynthesis and respiration?
 - a. Chemiosmosis
 - b. Glycolysis
 - c. Calvin cycle
 - d. Krebs cycle
2. Two reactants that are used in the process of photosynthesis are
 - a. water and carbon dioxide
 - b. glucose and water
 - c. carbon dioxide and oxygen
 - d. oxygen and water

3. The potential energy of organic molecules is most readily available to cells in the form of
- ribonucleic acid
 - ATP
 - water
 - minerals
- (b) Differentiate between Obligate anaerobes and Facultative anaerobes. (03)
- (c) Write short note on Pentose Phosphate pathway (03)
- Q.3. A) Brief note. (Each of 04 marks) (08)**
- What are the environmental factors which influence microbial growth? Explain briefly
 - Define Glycolysis. Summarize the glycolysis process stepwise.
- Q.3. B) Answer the following questions. (Any two)**
- Define following terms (Each of 02 marks) (04)
 - Generation time
 - Photolithotrophs
 - Write a short note on Electron Transport chain. (04)
 - Classify microorganisms based on their temperature range of growth (04)
- Q.4. A) Answer the following questions.**
- Fill in the blanks. (Each of 02 marks) (04)
 - Cotransport of nutrients in same direction is termed as _____
 - Some organisms can use reduced organic compounds as electron donors and are termed as _____
 - write briefly on ABC transporter mechanism of nutrient uptake in microbes (04)
- Q.4. B) Answer the following questions. (Any two)**
- Multiple choice questions. (Each of 01 marks) (03)
 - The microorganisms that grow best in a low-oxygen environment is called a/an
 - Aerobe
 - Anaerobe
 - Microaerophile
 - Facultative anaerobe
 - Which of these environmental factors influences microbial growth?
 - oxygen
 - water availability
 - pH
 - all of the above
 - Which is the phase of a growth curve where the number of cells dying equals the number of cells dividing?
 - Lag phase
 - Log phase
 - Stationary phase
 - Decline phase
 - What are the two types of bacterial photosynthesis? (03)
 - Define Fermentation (03)