

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

FIRST YEAR

B.A./B.SC. FIRST SEMESTER (July – December), 2012

Mid-Semester Examination, September 2012

Date : 10/09/2012

MICROBIOLOGY (Honours)

Time : 11 am – 1 pm

Paper : I

Full Marks : 50

1. a) Why did Carl Woese use the structure of ribosomal RNA for phylogenetic classification? [2]
- b) What is matching coefficient in numerical taxonomy? [1]
- c) Write two exceptions of Koch's postulates. [2]
- d) What is tyndalization? [2]

OR

- a) Write the advantage of agar over gelatin as a solidifying agent. [2]
- b) What is abiogenesis? [1]
- c) How did Louis Pasteur present experimental proof in support of biogenesis. [3]
- d) What is germ theory of disease? [1]
2. a) What do you mean by alternative axis of symmetry? Give example. [2]
- b) Give an example of chirotopic with non stereogenic molecule and a chirotopic with stereogenic molecule. Give example. [3]
- c) Write down the R/S nomenclature of D-alanine and L-glyceraldehyde. [2]
- d) What are the symmetry present in cyclobutane molecule? [1]
- e) Write down the structure of D-glucose and D-mannose with their R/S configuration. [2]

OR

- e) What are the limitations of D/L nomenclature. Discuss with example. [2]
3. Write the structure of **any two** of the following : [2×2]
- a) Deoxythymidylic acid
- b) Hypoxanthine
- c) syn-d ATP
- d) 2', 3' - cAMP

4. Write short notes on **any three** of the following : [2×3]
- a) Chromogen
- b) Leuco compound
- c) Principle of Gram staining
- d) Acidic staining

5. a) Write down the structure of two phospholipids present in the membrane of *E. coli* cells. [2]
- b) Write down the chemical structure of glycan tetrapeptide present in cell wall of *Staphylococcus aureus*. [2]
- c) Write down the structure of LPS present in the cell wall of *Salmonella sp.* [2]

6. What happens to the bacterial cell membrane when treated with detergent? What are the important features of the cell membrane of hyperthermophilic archaeobacteria. [2+2]

OR

What is teichoic acid? Write down the important functions of bacterial capsule. [2+2]

7. a) Explain the Bronsted-Lowry concept of an acid and base. [2]
- b) Define buffer capacity. [2]

- c) What is the pH of a 10^{-8}M solution of HCl? [3]
 d) What do you mean by counter ion effect? [1]

OR

- a) What is true acidity and titrable acidity? Explain with examples. [2+1]
 b) Explain the Arrhenius concept of acid and base. [2]
 c) Determine the pOH of a 0.0034M of HNO_3 solution. [2]
 d) What are ampholytes? [1]
8. a) Define histogram and histograph. [2+2]
 b) What is variable? [1]

OR

Find a suitable measure of central tendency

Class boundary	Frequency
50 – 60	4
60 – 70	12
70 – 80	8
80 and above	1
Total	25

For a moderately symmetric distributions mean and median are 25 and 25.5, respectively. Find mode. [4+1]

