RAMAKRISHNA MISSION VIDYAMANDIRA
(A Residential Autonomous College)
Belur Math, Howrah

B.A./B.Sc. 1st Semester (July – December 2010)
Mid-Semester Examination, September 2010

Date: 06.09.2010   **Microbiology (Honours)**   Full Marks 50
Time: 11 am – 1 pm

Group - A

1.
a) What is questionnaire?   1
b) What is relative frequency?   1
    If class frequency is 12 and width of the class is 4, calculate frequency density.   1.5
c) Name the different types of diagrammatic representation of data   1.5

OR

a) What is variable?   1
b) What is class width?   1
    If class frequency is 34 and total frequency is 100. Calculate relative frequency of the class.   1.5
c) Mention the different types of graphical representation of grouped data.   1.5

2.
a) Define the term "Surface tension" and "Viscosity".   1+1
b) What is the ratio of [HCOOH]:[HCOONa] to prepare a solution of pH 2. (Given $K_{HCOOH}=2\times10^{-4}$)   3
c) What is the difference between "true acidity" and "titrable acidity"? Explain with proper examples.   2
d) How many milliliters of 0.05 N HCl are required to neutralize exactly 8.0 gm of NaOH?   2

OR

a) How many i) H^+ ions ii) OH^- ions are present in 250 ml of a solution of pH 3?   1+1
b) Define polyprotic acid. Give proper examples.   2
c) How many milliliters of 5 M H_2SO_4 is required to make 1500 ml of a 0.002 M H_2SO_4 solution?   2
d) What are the concentrations of HOAc and OAc- in a 0.2 M "acetate" buffer, pH 5.00? The Ka for acetic acid is 1.70×10^{-5} (pKa=4.77).   3

3. Compulsory question :-
a) Molecule possesses centre of symmetry will also have alternative axis of symmetry.- Justify.   3
b) Give an example of i) chirotopic with non stereogenic centre , ii) achirotopic with stereogenic centre.   2

4.
a) What are the symmetry elements present in cyclopropane?   1
b) Write down the R/S configuration of the following molecules – i) D-glucose, ii) D-alanine, iii) proline, iv) meso tartaric acid   4
c) Draw the structure of cis -4- t- butylcyclohexanone.   1
d) What do you mean by dihedral angle?   1
e) Draw an energy profile diagram of n-Butane as function of dihedral angle C2 - C3 bond.   3

a)	Draw an energy profile diagram of cyclohexane.	3
b)	What do you mean by **Butane –Gauche** interaction?	2
c)	Draw the Newman and Sawhorse projection formula of active tartaric acid? (Both staggered and eclipse form).	2
d)	Alkali hydrolysis of Cis -4-t- butyl cyclohexane carboxylate is faster than that of its trans Isomers – comment on the statement.	3

Group - B

5.

Write a definition of algae.	1
What are the differences between cyanophyceae and chlorophyceae?	2
What characteristics do you find in heterocyst?	2

OR

| What is hopanoid? | 2 |
| Write the features of Archaebacteria cell membrane with the structures of the lipids found. | 3 |

6.

a)	What is meant by abiogenesis?	1
	How did Louis Pasteur disprove the theory of biogenesis?	2
b)	Write two exceptions of Koch's postulation.	2

OR

| a) | What is chemotherapy? What is meant by tyndalization? | 1+2 |
| b) | Who and how established the germ theory of disease? | 2 |

7.

| a) | How did Carl Woese classify organisms into three major domains? | 3 |

OR

| a) | What is dendrogram? How is it prepared? | 3 |

8.

a)	Define Mordant with suitable examples.	2
b)	Why do acidic dye stain better in acidic medium and basic dyes in basic medium?	4
c)	Why are bacteria stained?	2

OR

a)	Write short notes on –	
	i) Chromophore	3
	ii) Auxochrome	3
b)	Why is heat fixing and washing the smear with water not done during Capsule staining?	2

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