PG/IS/MCB-103/13

# M.Sc 1st Semester Examination, 2013

## MICROBIOLOGY

PAPER – 103

*Full Marks* : 40

*Time* : 2 hours

Answer any **two** questions from each Group

*The figures in the right hand margin indicate marks*

*Candidates are required to give their answers in their own words as far as practicable*

*Illustrate the answers wherever necessary*

## GROUP – A

[*Marks* : 20]

1. (*a*) Justify the equation "$K_a \times K_b = K_w$".

   (*b*) What is the pH of $10^{-7}$M HCl aqueous solution.

(*c*) What do you mean by activity co-efficient ?

$4 + 4 + 2$

**2.** (*a*) "Scintillation counter is preferred over GM counter"– Justify the statement.

(*b*) Describe the operating principle of Geiger Muller Counter.

(*c*) What is Curie ?

(*d*) What do you mean by specific activity ?

$3 + 5 + 1 + 1$

**3.** Write short notes on (any *four* ) : $2\frac{1}{2} \times 4$

(*i*) Importance of hydrogen bond.

(*ii*) Why water is an excellent solvent for any polar molecule ?

(*iii*) Different types of movement of lipid in biological membrane.

(*iv*) Fluid mosaic model of membrane

(*v*) Ionizing radiation.

(*vi*) α-radioactive particle.

## GROUP – B

[*Marks* : 20]

**4.** (*a*) Write down essential feature of a Scanning Electron Microscope.

(*b*) Compare the nature of spectra in NMR and ESR. Write on standard used in NMR and ESR.

(*c*) Write principle of CD and ORD. $3+(2\frac{1}{2}+2)+2\frac{1}{2}$

**5.** (*a*) Explain Beer-Lambert's Law.

(*b*) How image is formed in confocal microscope ?

(*c*) What is crystallography ? Write down the steps to be followed for preparation of a protein crystal.

(*d*) What are the types of chromatography ? $2+3+3+2$

**6.** Write short notes on (any *four* ) : $2\frac{1}{2}\times 4$

(*i*) Contact mode AFM

(*ii*) Explain with labelled diagram the working principle of a transmission electron microscope

(*iii*) Explain basic elements in a Mass Spectroscopy

(*iv*) Ultracentrifuge

(*v*) Method of Protein Sequencing

(*vi*) Use of flow Cytophotometry.

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