2012

M.Sc.

1st Semester Examination

MICROBIOLOGY

PAPER—III (MCB-103)

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Answer any *two* questions from each group.

Group—A

[Marks : 20]

Answer any *two* questions.

1. (a) Why pH of a solution is not always the negative logarithm of hydrogen ion concentration? 2

(b) Describe how pH of a weak acid solution can be calculated. 3

(c) What is buffer? How does a buffer works? 1+4

2. (a) What is buffer capacity? 2

(b) Show the reactions by which an acetate buffer resists change in pH upon the addition of OH^- and H^+ ions. 5

(c) Determine the molar concentration of water. 3

3. (a) Describe the possible causes of γ-radiation. 3

(b) What is decay constant? 2

(c) Why ionizing radiation is harmful for biological system? 3

(d) What is Cerenkov radiation? 2

Group—B

[Marks : 20]

Answer any *two* questions.

4. (a) How does principle of NMR differ from that of ESR? 3

(b) Mention 3 disadvantages of C–NMR over H–NMR? How these one overcome? 2

(c) What are the important properties of some common NMR solvents? $2\frac{1}{2}$

(d) What are the molecular basis for platue formation in standard curve at upper concentration in visible spectroscopy? $2\frac{1}{2}$

5. (a) Write the different uses of HPLC and GC.

(b) Briefly describe three types of detectors used in HPLC. What is the difference between UV and PDA detectors?

(c) Write the principles of GC and GCMS. 3+(3+2)+2

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

(a) Resolving power of lens.

(b) Visible spectrum of light.

(c) Principle of PAGE.

(d) Ion exchange chromatography.

(e) Principle of X-ray diffraction

(d) Quantification of a chromophoric group by HPLC.
