PG/IS/MCB-103/19

M.Sc. 1st Semester Examination, 2019

MICROBIOLOGY

PAPER – MCB-103

Full Marks : 40

Time : 2 hours

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

Write the answers to Questions of each Units in separate books wherever necessary

GROUP – A

[Marks : 20]

1. Answer any *two* questions : 2×2

   (*a*) Define buffer with example.

   (*b*) Mention the non-covalent bonds which stabilizes biomolecules.

(*c*) State the principle of visible spectroscopy.

(*d*) Mention the applications of gas chromatography.

2. Answer any *two* questions : 4×2

(*a*) State the unique properties of water which make it universal solvent ? 4

(*b*) Explain the Henderson-Hasselbalch equation. 4

(*c*) State the applications of radioisotopes. 4

(*d*) State the principle of HPLC ? What are the different types of detectors used in HPLC. $3 + 1$

3. Answer any *one* questions : 8×1

(*a*) What is cation and anion exchanger ? Mention the advantages and disadvantages of SEM. Mention two uses of mass spectrometry. $\left(1\frac{1}{2}+1\frac{1}{2}\right)+(2+2)+1$

(*b*) Write short notes on (any *four*) : 2×4

(*i*) Covalent bonds in protein

(*ii*) Entropy

(*iii*) Applications of gel filtration chromatography

(*iv*) Resolving power of microscope

(*v*) Principle of centrifugation.

GROUP – B

[Marks : 20]

4. Answer any *two* questions : 2 × 2

(*a*) What do you mean by life cycle of a protein ?

(*b*) Mention the specific cleavage site of trypsine and thrombin on polypeptide chain.

(*c*) 'Sucrose is a non reducing sugar' – Justify the statement by elucidating the chemical structure.

(*d*) What is Kcat ? State its significance.

5. Answer any *two* questions : 4 × 2

(*a*) Write a brief note on Ramachandran plot. 4

(*b*) What do you mean by methylation of protein and its epigenetic importance ? 2 + 2

(*c*) State one periplasmic transport system in bacteria. 4

(*d*) Describe the role of ATP synthase (F_0 - F_1 ATP ase) in ATP synthesis. 4

6. Answer any *one* question : 8 × 1

(*a*) Describe protein folding mechanism promoted by Chaperones. 8

(*b*) State the salient features of allosteric enzymes ? How compititive inhibitors affects K_m and V_{max} of enzyme. 5 + 3