Roll No. : .....

Total No. of Questions : **16**] [Total No. of Printed Pages : **3**

MICRSEM–139

M.Sc. (Ist Semester) Examination Dec., 2022

MICROBIOLOGY

Paper – MB–102

(Microbial Physiology and Biochemistry)

*Time : **3** Hours*] [*Maximum Marks : **40***

The question paper contains three Sections.

Section–A **(Marks : 1 × 10 = 10)**

Note :– The candidate is required to answer all the *ten* questions carries **1** mark each. The answer should not exceed **50** words.

Section–B **(Marks : 3 × 5 = 15)**

Note :– The candidate is required to answer *five* questions by selecting at least *one* question from each Unit. Each question carries **3** marks. Answer should not exceed **200** words.

Section–C **(Marks : 5 × 3 = 15)**

Note :– The candidate is required to answer *three* questions by selecting at least *one* question from each Unit. Each question carries **5** marks. The answer should not exceed **500** words.

Section–A

1. (i) Which bonds hold together the hydrogen and oxygen atoms of an individual water molecule ?

   (ii) Write *two* characteristics of biocatalysts which make them superior to non-biological catalysts.

   (iii) Write *two* purposes of allosteric sites present in enzymes.

   (iv) Which type of lipid acts as a precursor of hormones ?

   (v) What are the common names of the vitamins (a) Niacin (b) Folic acid ?

   (vi) What is the value of ΔG of a reaction at equilibrium ?

   (vii) Write *two* functions of Cytochromes.

   (viii) Give *two* examples of a microbe which can oxidize Fe(II) ?

   (ix) What is the purpose of deamination of amino acids ?

   (x) What is the fate of pyruvic acid under anaerobic condition ?

Section–B

Unit–I

2. Write a note on Oxidoreductases.

3. Write a note on role of van der Waals interactions in maintaining the structure of a bio-molecule.

4. Write a note on sequential feedback inhibition of enzymes.

Unit–II

5. Briefly outline the Biosynthesis of Ketone Bodies.

6. Write a note on Glucogenic Amino Acids.

7. Write a note on inhibitors of ETC.

Unit–III

8. Write a note on Bioluminescence.

9. Briefly outline how a protein can be used as substrate to gain energy.

10. Entner Doudroff Pathway.

Section–C

Unit–I

11. Give a comprehensive account on enzyme purification methods.

12. Write notes on the following :

    (i) K_m

    (ii) Enzyme specificity

Unit–II

13. Write notes on the following :

    (i) Substrate level phosphorylation

    (ii) Anoxygenic photosynthesis

14. Give a comprehensive account on bioenergetics.

Unit–III

15. Write notes on the following :

    (i) Microbial oxidation of nitrogen

    (ii) Heterolactic fermentation

16. Give a detailed account on ETC and oxidative phosphorylation.