

2022

Microbiology

[P.G.]

(M.Sc. First Semester End Examinations-2022)

PAPER-104

[Microbial Physiology and Metabolism]

Full Marks: 40

Time: 02 Hrs

*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

(MCB-104.1)

1. Answer any two question from the following: 2x2= 4
  - a. What is cold shock protein?
  - b. What is Phenol Co-efficient?
  - c. What are bio preservatives?
  - d. What are bioluminescent bacteria?
  
2. Answer any two question from the following: 2x4= 8
  - a. Define regulon? What are the advantages of quorum sensing mechanism? 1+3
  - b. Write short note on pho-regulon.. 4
  - c. Write down the toxicity of O<sub>2</sub> on anaerobics.
  - d. Write down the significance of chemostat and turbidostat.

(2)

3. Answer any one question from the following: **1x8= 8**
- What is bacterial two component system? Write brief note on bacterial batch culture system. Why moist heat is more significant than dry heat for sterilization process? **2+4+2**
  - Write the metabolic pattern chemolithotropic microbes. Write down any two process of microbial growth measurement. State the importance of pure culture? **3+3+2**

**Group-B**  
**(MCB-104.2)**

**Marks 20**

1. Answer any two question from the following: **2x2= 4**
- Write the biological importance of lipid.?
  - What is significance of  $Mg^{2+}$  ions in glycolysis?
  - What are the precursors of purine and pyrimidine in denovo biosynthesis?
  - Why Citric acid cycle is called TCA cycle?.
2. Answer any two question from the following: **2x4= 8**
- What is the net gain of ATP from glycolysis in aerobic condition. Differentiate between substrate level and oxidative phosphorylation with example. **1+3**
  - What is PHB? When it is biosynthesis? What is PUFA? **1+2+1**

(3)

- Schematically represent the photosynthesis of aerobic and anaerobic bacteria. **4**
  - Differentiate b/w homolactate and alcoholic fermentation. Write the basis steps of Glutamine biosynthesis. **2+2**
3. Answer any one question from the following: **1x8= 8**
- Describe the mechanism of nitrogen fixation in Rhizobium-legume symbiosis. What is nif regulon? **6+2**
  - Write down the mechanism of chemiosmosis. Discuss the function of cytochrome in oxidative phosphorylation. State the importance of pentose phosphate pathway. **3+3+2**
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