

**Micro Biology (P.G.)****[CBCS]****M.Sc. First Semester End Examination-2023****(Regular & Supplementary Paper)****PAPER- MCB-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)****Full Marks 20**

1. **Answer any two questions of the following:** **2x2= 4**
  - a. What is synchronous growth? 2
  - b. How do microbes adopt to osmotic stress? 2
  - c. What is chemotherapeutic agent? Give example. 1+1
  - d. What is pure culture? Why is it important? 1+1
  
2. **Answer any two questions of the following:** **2x4= 8**
  - a. Describe two component quorum sensing signaling event. What is pho-regulan? 3+1
  - b. Classify bacteria according to nutrient requirement with example. 4
  - c. Write down the effect of heavy metal on bacterial growth? What is cold shock-protein. 3+1

(2)

- d. Write down the significance of lag phase of bacterial growth.  
Write down the role of uncouplers in ATP synthesis. 2+2

3. Answer any one question of the following: 1x8=8

- a. What is lyophilization technique? What is its importance in culture preservation? 3+5
- b. Write the principle of anaerobic work station.  
Write down the oxygen toxicity mechanism on anaerobes. Give example an extremophile. 3+4+1

**Group B (MCB 104.2)**

**Full Marks 20**

1. Answer any two questions of the following: 2x2= 4

- a. Write about the type of reaction associated with the conversion of fumarate to malate. 2
- b. What is PHB? Draw structure. 1+1
- c. What is denitrification? Name one agent. 1+1
- d. Write down the applications of electron microscopy. 2

2. Answer any two questions of the following: 2x4= 8

- a. Mention the underlying reasons of aerobes utilizing O<sub>2</sub>. Why is O<sub>2</sub> toxic to many micro-organisms? 2+2
- b. Calculate the ATP yield in eucaryotes for both glycolysis and the total aerobic oxidation of glucose. Explain your own. 4
- c. What is EMP pathway? Draw the structure. 3+1

(3)

- d. What is the role of MO in Nitrogen fixation? What is meant by assimilatory nitrate reduction and dissimilatory nitrate reduction?

2+2

3. Answer any one question of the following: 1x8=8

- a. Discuss about exergenic and endergonic reaction? Write the example of major bioenergetic process. 4+4
- b. Write note on UV-vis spectro photometry. 8

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