

2021

Microbiology

[P.G.]

(CBCS)

(M.Sc. First Semester End Examinations-2021)

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)

Marks 20

- 1. Answer anytwo question from the following: 2x2= 4**
- a. What are bioluminescent bacteria? 2
 - b. What is compatible solute? Give example. 2
 - c. What is meant by Diauxic growth? 2
 - d. Write down one physical and one chemical agent for the control of bacterial growth? 2
- 2. Answer any two question from the following: 4x2= 8**
- a. What is quorum sensing? Write a brief overview of the quorum sensing process. 1+3

(2)

- b. What is regulon? Write a short note on Phoregulon. 1+3
- c. Write a short note on oxygen toxicity. 4
- d. What is pure culture? Write down its characteristics. 2+2

3. Answer any one question from the following: 8x1= 8

- a. What do you mean by bacterial two component system? Write down the general mechanism for “Two-component” regulatory system with schematic diagram. 2+4+2
- b. Give a brief description on Growth kinetics. Mention the mode of action of Gamma ray in microbial growth control. How can anaerobic microorganisms be cultured? 4+2+2

Group-B (MCB-104.2)

Marks 20

1. Answer any two question from the following: 2x2= 4

- a. What is the significance of Mg²⁺ ions in glycolysis? 2
- b. Name the enzyme and the cofactor required for the conversion of isocitrate to α - ketoglutarate. 2
- c. What are azo ferridoxin and molybdoferri doxin? 2
- d. What is the common regulatory method for both purin and pyrimidine biosynthesis? 2

2. Answer any two question from the following: 4x2= 8

- a. Why PHB is biodegradable? Mention the four applications of PHB. 4

(3)

- b. Why hyaluronic acid has a great capacity to hydrate? Mention the two function of hyaluronic acid. 2+2
- c. Differentiate between homolactate and alcoholic fermentation. 4
- d. State the importance of hexose monophosphate shunt pathway. 4

3. Answer any one question from the following: 8x1= 8

- a. How many molecules of acetyl CoA are produced from a single molecule of glucose for participation in the Krebs cycle? Where does the Krebs cycle occur in a cell? What products of glucose oxidation are essential for oxidative phosphorylation? Discuss the function of cytochrome in oxidative phosphorylation. What act as terminal electron acceptor in oxidative phosphorylation? 1+1+2+3+1
- b. What are essential amino acids? Describe briefly two pathways for glutamate synthesis. 8
