

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Third Semester)

Branch - MICROBIOLOGY

MICROBIAL PHYSIOLOGY AND METABOLISM

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

- 1 Which of the following is the nutritional characterization of *Escherichia coli*?
(i) Autotrophic
(ii) Chemotrophic
(iii) Chemotrophic, Organotrophic, Heterotrophic
(iv) Organotrophic
- 2 Which of the following is used to grow bacterial cultures continuously?
(i) Chemostat (ii) Coulter Counter
(iii) Hemostat (iv) None of the above
- 3 Which one out of the following enzymes acts in the pentose phosphate pathway?
(i) Aldolase (ii) 6-phosphogluconate dehydrogenase
(iii) Pyruvate kinase (iv) Glycogen phosphorylase
- 4 What form of energy is required for fatty acid biosynthesis?
(i) ATP (ii) NADH
(iii) FADH₂ (iv) NADPH
- 5 How many ATP molecules are produced with the pyruvic acid at the end of Glycolysis process in the Anaerobic respiration?
(i) 1 (ii) 2
(iii) 3 (iv) 5

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a Summarises the role of micro and macro nutrients in bacterial growth.
OR
b Discuss the effect of Osmosis in bacterial growth.
- 7 a What is specific growth rate and generation time?
OR
b Distinguish the batch and continuous growth culture. Explain in detail.
- 8 a Describe the Entner - Duodoroff pathway with suitable diagram.
OR
b What is Bioluminescence? Explain the mechanisms in detail.
- 9 a Comment on biological synthesis and regulation of fatty acids.
OR
b Give an account on synthesis of amino acids.

Cont...

- 10 a Distinguish homo and hetero lactic fermentation.
OR
b What is respiration? Explain the anaerobic respiration and its mechanism in detail.

SECTION -C (30 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a Classify the microorganisms based on their nutritional requirement.
OR
b Discuss in detail about passive and active nutrient transportations.
- 12 a Highlight the four phases of microbial growth with neat sketch.
OR
b Justify the role of environmental factors influence the growth of microorganisms.
- 13 a briefly describe the TCA cycle with suitable diagram.
OR
b Elaborate the bacterial photosynthesis with neat sketch.
- 14 a Give a detailed account on bacterial cell wall with a note on peptidoglycan synthesis.
OR
b Give an account on synthesis of Purine and Pyrimidine.
- 15 a Define Fermentation. Write a brief note on Propionic and Butanol fermentation.
OR
b Describe the various types of electron acceptor in anaerobic respiration.

Z-Z-Z

END