

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch - APPLIED MICROBIOLOGY

MICROBIAL PHYSIOLOGY METABOLISM AND BIOLOGICAL CHEMISTRY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks!)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 ABC transporters are made of _____ helical proteins.
(i) 10 (ii) 12
(iii) 16 (iv) 8
- 2 Spore cortex is made of _____ .
(i) protein (ii) peptidoglycan
(iii) calcium dipicolinate (iv) tryptophan
- 3 Malate synthase and Isocitrate lyase are the key enzymes involved in
(i) ED pathway (ii) HMP pathway
(iii) Glycolysis (iv) Glyoxylate pathway
- 4 Bifidum pathway in lactic acid fermentation produces _____ ATP.
(i) 2.5 (ii) 1.5
(iii) 3.5 (iv) 4.5
- 5 Rate limiting enzyme in Glycolysis is _____ .
(i) hexokinase (ii) triose phosphate isomerase
(iii) phosphofructokinase (iv) enolase
- 6 In alkaliphiles Na^+ / H^+ _____ acidifies the cytoplasm to maintain pH homeostasis.
(i) uniporter (ii) antiporter
(iii) symporter (iv) biporter
- 7 RNA molecule can be estimated using _____ .
(i) orcinol (ii) diphenylamine
(iii) anthrone (iv) folin - cioclateau
- 8 A thicker right - handed duplex with a shorter distance between the base pairs has been described for RNA - DNA duplexes and RNA - RNA duplex which is called _____ DNA.
(i) A form (ii) B form
(iii) Z form (iv) D form
- 9 Membrane lipids of cells are made up of _____ .
(i) sphingolipids (ii) glycolipids
(iii) triglycerides (iv) phospholipids
- 10 Deficiency in vitamin D leads to
(i) beri beri (ii) rickets

SECTION - B (25 Marks!)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Outline the biosynthesis of fatty acids. Add an account on synthesis of phospholipids and archeal lipids.

OR

b Narrate the process of cell differentiation and morphogenesis with suitable illustrations.

12 a Bring out the role of Photosynthetic pigments and add a note on Anoxygenic photosynthesis.

OR

b Discuss the significance of Methanogenesis and HMP pathway.

13 a Apply the role of regulatory and non regulatory enzymes in controlling metabolic pathways?

OR

b State the significance of two component regulatory system.

14 a Explain the structure and functions of carbohydrates.

OR

b Compare the features of different inter molecular bonds in compounds.

15 a Outline the functions of water soluble vitamins.

OR

b Bring out the importance of enzymes in industrial products.

SECTION -C (40 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 x 8 = 40)

16 a Highlight the characteristics of different nutrient transport mechanisms observed in cells and the proteins and pumps involved in the reactions.

OR

b Summarise the molecular architecture of endospores and outline the process of endospore formation.

17 a Elucidate an account on Oxygenic photosynthesis coupled autotrophic ATP synthesis,

OR

b Illustrate the process of glycolysis, TCA, electron transport and ATP synthesis in aerobic and anaerobic organisms.

18 a Infer upon (i) Mixed acid and Butyric acid fermentation (ii) Chemolithotrophy.

OR

b Discuss the process of Quorum sensing and Heat shock response in bacteria.

19 a Analyze the structure, classification and functions of proteins. Add a note on estimation of proteins.

OR

b Differentiate the structure and functions of RNA molecules and point out the techniques to estimate nucleic acids.

20 a Classify the lipids according to structure and function and explain their characteristics.

OR