PAR-003-001527 Seat No. _____

Third Year B. Sc. (Sem. V) (CBCS) Examination

October / November – 2018

Microbiology : Paper-503

(Prokaryotic Metabolism)

(New Course)

Faculty Code : 003

Subject Code : 001527

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) All questions are compulsory.

(2) Figures on right indicate marks.

(3) Draw diagram wherever necessary.

1 Answer the following questions : **20**

(1) What is Pheophytin ?

(2) What is the role of Phycobilins in photosynthesis ?

(3) Give full form of UDP.

(4) Give full form of RUBISCO.

(5) What are precursor molecules ?

(6) What is entropy ?

(7) What are allosteric site ?

(8) Give full form of NAD.

(9) Give full form of KDPG.

(10) What is HMP shunt ?

(11) When ATP converts into ADP, ΔG° is _____.

(12) The modified TCA is called.

(13) What are methanogens ?

(14) What is nitrate respiration ?

(15) Enzyme that converts formic acid to CO2 and H2.

(16) Vibrio is the aquatic bacteria of _____ group of Bacteria.

(17) The concept of free energy was given by _____.

(18) Mechanosensitive channels in bacteria are used to reduce _____.

(19) What are siderophores ?

(20) What is phosphotransferase system ?

2 (a) Answer the following in short : (**3** out of **6**) **6**

(1) What is reduction reaction and reducing agent ? Name any two reducing agents.

(2) Draw the structure of ATP.

(3) What is beta oxidation of fatty acid ? Give name of two fatty acids which can be degraded by this mechanism.

(4) What is photosynthesis ? Give equation for photosynthesis process.

(5) In which condition Cell membrane of Halobacterium turns purple ? Give name of the chemical responsible for purple colour of the membrane and state its importance.

(6) Write names of various movements of lipids in membrane that give fluidity to membrane.

(b) Answer the following : (**3** out of **6**) **9**

(1) Differentiate simple diffusion from facilitated diffusion.

(2) Hydrogenase system in Hydrogen bacteria.

(3) Discuss in brief Calvin Benson cycle (C4 pathway)

(4) What are auxotrophs ? Give its application in studying biosynthesis.

(5) Discuss in brief Glyoxylate cycle.

(6) Role of ATP in metabolism.

(c) Answer the following : (**2** out of **5**) **10**

(1) Derive Michaelis Menten equation for non-regulatory enzymes.

(2) How pyruvate is converted to oxaloacetate ? Describe the whole pathway and write the regulatory steps of this pathway.

(3) What is cellular respiration ? Draw the diagram and discuss each components in detail.

(4) Discuss speciality of methanogens with respect to energy synthesis and carbon assimilation.

(5) Discuss in detail quorum sensing.

3 (a) Answer the following in short : (**3** out of **6**) **6**

(1) What is metabolism ? What is bioenergetics ?

(2) Differentiate regulatory and non-regulatory enzymes.

(3) Explain deamination and decarboxylation reaction.

(4) Draw the structure of beta carotene.

(5) What are Nitrifying bacteria ? Give two examples of Nitrifying bacteria.

(6) What are integral proteins and peripheral proteins ?

(b) Answer the following : (**3** out of **6**) **9**

(1) What is active transport ? What are antiport and symport ?

(2) Discuss Sulphur bacteria.

(3) Discuss Light dependent reaction in green sulphur bacteria.

(4) What are radioactive substances ? Discuss their role in studying pathway.

(5) What is Phosphofructokinase ? Explain its role in glycolysis.

(6) Explain conformational changes in regulatory enzymes.

(c) Answer the following : (**2** out of **5**) **10**

(1) What is cell signalling ? Discuss Signal transduction as cell signalling mechanism.

(2) Discuss Fermentative metabolism and physiological characters of the Enteric Bacteria.

(3) What is peptidoglycan ? Discuss peptidoglycan synthesis in detail.

(4) Discuss in detail oxidation of Palmitic acid.

(5) What are energy rich compounds ? Draw the structures of five energy rich compounds and explain free energy.
