This question paper contains 2 printed pages.

Your Roll No. .....

Sl. No. of Ques. Paper : **2067** **GC-3**

Unique Paper Code : **32531325**

Name of Paper : **Microbial Physiology and Metabolism**

Name of Course : **B.Sc. (Hons.) Microbiology (CBCS)**

Semester : **III**

Duration : : **3 hours**

Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all. All questions carry equal marks.
Attempt all parts of a question together.

1. (a) Define any *six* of the following:

   (i) Continuous culture

   (ii) Generation time

   (iii) Water activity

   (iv) P:O ratio

   (v) Specific growth rate

   (vi) Symport

   (vii) Pasteur effect. 2×6=12

   (b) Discuss the significance of PPP pathway. 3

2. Differentiate between any *three* of the following:

   (a) Facilitated and Passive diffusion

   (b) Linear and Branched fermenation pathways

   (c) Oxygenic and Anoxygenic photosynthesis

   (d) Assimilatory and Dissimilatory nitrate reduction. 5×3=15

3. (a) Give the contributions of the following scientists:

   (i) Hans Krebs

   (ii) Peter Mitchell

   (iii) Loomis and Lipman. 2×3=6

P. T. O.

(b) Give an account of hydrogen oxidation by chemolithotrophic bacteria. 6

(c) Define nitrate/ammonia respiration. 3

4. (a) Give an example of each of the following (any *five*):

(i) Microaerophile

(ii) Anaerobic chemolithotroph

(iii) Mixotroph

(iv) ATP synthase inhibitor

(v) Hyperthermophile

(vi) Halophile. 1×5=5

(b) Write short notes on the following:

(i) ED Pathway

(ii) PEP-PTS 5×2=10

5. (a) Compare and contrast mitochondrial and bacterial ETC. 5

(b) Write the complete balanced equation for the reactions catalysed by the following enzymes (any *three*):

(i) Pyruate kinase

(ii) Transaldolase

(iii) Nitrogenase

(iv) Phosphoketolase. 2×3=6

(c) What are chlorosomes? Explain their significance. 4

6. (a) How do microorganisms adapt themselves to extreme conditions of pH? 5

(b) What is substrate level phosphorylation? Explain giving a suitable example. 4

(c) Discuss the mechanism of iron uptake in bacteria. 6