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Your Roll No. .....

1032

B.Sc. (Hons.)/II **C**

MICROBIOLOGY—Paper VIII

(Microbial Physiology and Metabolism)

(Admissions of 2004 and onwards)

Time : 3 *Hours* *Maximum Marks* : 60

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

Attempt any *four* questions in all.

All questions carry equal marks.

1. (*a*) Define the following terms giving suitable examples (any *six*) : 6×2=12

(*i*) Denitrifier

(*ii*) Photoorganotroph

(*iii*) Compatible solute

P.T.O.

(*iv*) Strict anaerobe

(*v*) P : O ratio

(*vi*) Uncoupler

(*vii*) Electrogenic transport

(*viii*) Butyrate producer.

(*b*) What is Pasteur effect ? Explain. 3

2. (*a*) What do you understand by diauxic growth ? Elaborate your answer giving a suitable example. 4

(*b*) How are the thermophilic microorganisms adapted to grow at such extremes of temperature ? 4

(*c*) Describe Mitchell's hypothesis. Write any *two* experimental evidences in its favour. 2+3 5

(*d*) What are siderophores ?

Or

What is Liebig's law of minimum ? 2

3. (*a*) Differentiate between the following pairs (any *three*) :

(*i*) Oxygenic and anoxygenic photosynthesis

(*ii*) Homolactate and heterolactate fermentation

(*iii*) Assimilatory and dissimilatory nitrate reduction

(*iv*) Turbidostat and chemostat. 3×4=12

(*b*) Why do most chemolithotrophs perform reverse electron transport ? 3

4. (*a*) Write critical notes on the following (any *three*) : 3×4=12

(*i*) Reductive TCA cycle

(*ii*) Bacterial electron transport chain

(*iii*) Quorum sensing

(*iv*) PEP-PTS.

(*b*) Comment on the multifunctional aspect of PPP. 3

5. (*a*) Differentiate between a linear and branched fermentation pathway. How do the organisms benefit from the latter ? Explain giving a suitable example ? 4

(*b*) Define the following terms :

(*i*) Aerobic respiration

(*ii*) Anaerobic respiration

(*iii*) Fermentation. 3×2=6

(*c*) Describe the mechanism of action of enzyme nitrogenase. List its salient properties. 5