Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/BT(N)/SEM-3/BT-303/2012-13

2012

MICROBIOLOGY

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives from the following : 10 × 1 = 10

i) A family tree constructed during the study of phylogenetic classification is

a) Dendogram b) Histogram

c) Hologram d) Cladogram.

ii) Which of the following amino acid is absent in the cell wall of bacteria.

a) L-alanine b) D-glutamic acid

c) D-Lactic acid d) L-aspdrtic acid.

iii) Which the following substance is abundantly found in endosphores ?

a) Gluconic acid

b) Dipicolinic acid

c) Adipic acid

d) Poly β hydroxyl butyrate.

iv) The antibacterial agent Rifampin is isolated from

a) *Streptomyces venezualae*

b) *Streptomyces griseue*

c) *Streptomyces lincolnensis*

d) *Streptomyces mediterrani.*

v) Which of the following virus have ssRNA as a genetic material ?

a) SV 40 virus b) Polio virus

c) Herpes simplex virus d) Reo virus.

vi) The nueleic acid base sequence most widely used in phylogenetic studies of bacteria is

a) *m* RNA b) *t* RNA

c) 16 *s r* RNA d) 23 *s r* RNA

vii) Which of the following set of organisms belong to archaebacteria

a) Mycoplasma, Sarcina, Pneumoccus

b) Methanosarcina, Halococcus, thermoplasma

c) Nitrosococcus, Nitromonas, Erwinia

d) Streptroccus, Nitrococcus, Halococcus.

viii) Mycoplasmas are different from other prokaryotes by

a) presence of ehitin in cell wllas

b) presence of murein in cell walls

c) presence of protein in cell walls

d) absence of cell wall itself.

ix) The two key enzymes of glyoxylate cycle are

a) Isocitrate dehydrogenase, α keroglutarate dehydrogenase

b) Isocitrate lyase, α keroglutarate dehydrogenase

c) Isocitrate lyase, Malate synthase

d) Isocitrate dehydrogenase, Malate synthase.

x) The refractive index of immersion oil used in microscopy to achieve higher resolution in

a) same as glass b) less than air

c) less than glass d) same as air.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Differentiate between the growth rate and the generation time of a bacteria. Prove that $K = \ln 2/g$ where g = doubling time, K = growth rate constant ? 2 + 3

3. Describe the following kinds of media and their specific uses : 5×1

a) defined or synthetic media

b) complex media

c) enriched media

d) selective media and

e) differential media.

4. What is anaerobic respiration ? Briefly describe the importence of Nitroge Fixitim in bacteria ? 2 + 3

5. With the help of a net diagram describe the life cycle of algae.

6. Explain why energy output in anaerobic respiration is less than aerobic respiration.

7. Write a short note on genetics of nitrogen fixation.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) What types of bacteria use the phosphoketolase pathway ? Write briefly about this path way. 2 + 7

   b) What is glyoxylate cycle ? What is the importance of this cycle ? 4 + 2

9. Differentiate between the following pairs : 5 × 3 = 15

   a) Denitrification and nitrification reactions

   b) Symbiotic and nonsymbiotic nitrogen fixation

   c) Aerobic and anaerobic respiration

   d) Sterilization and pasteurization

   e) Gram positive and gram negative bacterial cell wall.

10. a) How do hyperthermophiles survive in high temperature.

    b) Briefly describe the process of sporulation in bacteria. 8 + 7

11. a) Briefly explain the role of chlorophyll and bacteria chlorophyll in photosynthesis.

    b) Write about ozygenic photosynthesis. 7 + 8

12. Write short notes on any *three* : 3 × 5 = 15

    i) Life cycle of mould

    ii) Principle of Scanning Electron Microscopy

    iii) Ribotyping

    iv) General Life cycle of virus.