*Name :* .....

*Roll No. :* .....

*Invigilator's Signature :* .....

**CS/B.TECH(BT-OLD)/SEM-3/BT-302/2011-12**

# 2011
# 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

**( Objective Type Questions )**

1. Answer any ten of the following : 10 × 1 = 10

A. Choose the correct alternatives for of the following :

i) The time required for a cell to divide into two is also known as

a) Generation time b) Growth rate

c) Total time d) None of these.

ii) Nitrate respiration is an example of

a) Dissimilatory nitrate reduction

b) Assimilatory nitrate reduction

c) Both (a) and (b)

d) none of these.

iii) Cold loving organisms are also called

a) Psychrophile b) Mesophile

c) Hallophile d) Barophile

iv) The cofactor required for nitrogen fixation is

a) Co b) Ni

c) Mo d) none of these.

v) Sporulation is observed in bacteria of genus

a) Pseudomonus sp. b) Streptococcus sp.

c) Clostridium sp. d) none of these.

vi) Cocci in clump is also called

a) Monococci b) Diplococci

c) Streptococci d) Staphylococci.

vii) The spore produced during sexual reproduction of some fungi is

a) Sporangiospore b) Arthrospore

c) Blastospore d) Ascospore.

viii) The nucleic acid base sequence most widely used in *phylogenetic* studies of bacteria is

a) mRNA b) tRNA

c) 16SrRNA d) 23SrRNA.

ix) The bacteriophage with a single stranded circular genomic DNA is

a) T4 phage b) λ phase

c) MS2 d) ϕX174.

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

a) same as glass b) less than air

c) less than glass d) same as air.

xi) Presence of bacteria in air was first demonstrated by

a) Louis Pasteur b) Lister

c) Ronald Ross d) Koch.

B. Fill in the blank.

xii) The water soluble pigments phycoerythrin and phycocyanin are found in ..... .

## GROUP – B

### ( Short Answer Type Questions )

Answer any *three* of the following. 3 × 5 = 15

2. Describe the Entner-Doudodroff pathway of glucose dissimilation with a schematic outline. 5

3. Write a short note on Whittaker's five knngdom concept. 5

4. Is nutrient broth a selecture media ? Can all bacteria be cultured in petri plates ? Justify. 1 + 1 + 3

5. What is the difference between a gram-positive and gram-negative bacteria ? 5

## GROUP – C

### ( Long Answer Type Questions )

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

6. Explain the 'S' cycle stating its importance. Name one S-oxidizing and one S-reducing bacteria. Explain with example how inorganic nitrogen as well as sulphur compounds get incorporated into organic compounds.

5 + 2 + 8

7. What happens when nitrate acts as the terminal electron acceptor ? Explain why some bacteria follow phosphoketolase pathway. What is Pasteur effect ? What are the different steps involved in bacterial dark reaction ?

4 + 3 + 2 + 6

8. Describe anaerobic respiration. Differentiate between photosystem 1 and photosystem 2. 9 + 6

9. Explain nif regulation. What is the function of leg haemoglobin ? Discuss about symbiotic nitrogen fixation.

6 + 2 + 7

10. How to hyperthermophiles survive in high temperature ? Briefly describe sporulation process. 8 + 7