CS/B.Sc(H)/Micro-Bio/SEM-2/MGR-204/2013

2013

MICROBIAL GROWTH & REPRODUCTION

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 for any *ten* of the following : 10x1 = 10

i) Organisms that grow well at 0°C and have optimum growth temperatures of 10°C or higher are called

a) Psychrotrophs

b) Psychrophiles

c) Mesophiles

d) Thermopiles.

ii) The plasmid which helps in cell survival is

a) F plasmid

b) Col plasmid

c) R plasmid

d) Vine lent plasmid.

iii) The size and number of bacterial cell is decreased in

a) Lag phase

b) Log phase

c) Stationary phase

d) Death phase.

iv) Ultraviolet light causes mutation in bacteria

a) by breaking chromosome

b) by binding thymine bases on opposite strand

c) by binding adjacent thymine bases

d) by breaking the DNA segments.

v) Techoic acid is found in

a) gram positive bacteria

b) gram negative bacteria

c) both of these.

d) none of these.

vi) Which protein determines the shape of bacterial cell ?

a) Fts Z

b) Fts I

c) Mer B

d) Min D.

vii) Which protein is not involved in homologous recombination ?

a) Ruv A

b) Ruv B

c) Rec A

d) Cresentin.

viii) Which of the following procedures uses photocell to measure absorbance of the culture to regulate the flow of culture medium ?

a) Chemostat

b) Turbidostat

c) Petroff-Hausser chamber

d) None of these.

ix) Which method of gene transfer need direct contact with bacteria ?

a) Conjugation

b) Transduction

c) Transformation

d) None of these.

x) Proof reading activity of DNA polymeraseIII relies on

a) The Mut S, H, L repair system

b) 3' – 5' exonuclease activity

c) RNAse H activity

d) The UvrABC repair system.

xi) Which of the following processes is involved in DNA repair ?

a) Conjugation

b) Reverse of mutation

c) Transposition

d) Recombination.

xii) In order to persist and stably maintained in the cell, a plasmid DNA must contain

a) transfer gene

b) multiple cloning site

c) origin of replication

d) None of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3x5 = 15

2. Write about synchronous culture.

3. Write short notes on any one.

i) Endospore

ii) Binary fission.

4. What is pure culture ? Name various methods of isolation of pure cultures of microorganisms. 2 + 3

5. Write a short note on SOS response.

6. What is Hfr stain ? Why is it called so ? 1 + 4

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3x15 = 45

7. a) What is capsular ?

b) Write the importance of cell wall in bacterial cell.

c) Describe the composition and structure of peptidoglycan. 5 + 5 + 2 + 3

8. a) Write a short note on bacterial growth phases.

b) In a culture media, both glucose & lactose are used as carbon sources. What do you get about bacterial growth and why ?

c) What is generation time ?

d) 1 ml 10^{-6} diluted soil solution give 23 number of colony in nutrient agar plate. How many cells were in the original sample ? 2 + 2 + 2 + 6 + 3

9. What is generation time ? Why is generation time in nature usually much longer than in culture ? If the generation time for a specific bacterium is 60 minutes and the initial population contains 10^{2} cells how many bacteria will there be after two hours of exponential growth ? Why does the population of growing bacterial cells enter into a stationary phase after sometime in a batch culture? 3 + 3 + 5 + 4

10. Write about the organisation of replicon and give concise account on isolation of microbial mutants. State the mechanism of error prone DNA repair mechanisms. 5 + 5 + 5

11. Who first described the sexuality in bacteria ? Describe the experiment originally demonstrated gene transfer between the two *E. coli* strains. What are the essential features of conjugations ? 2 + 5 + 8

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