

CS/B.Sc (H)/MICRO.BIO/SEM-2/MGR-204/2012

2012

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 55°C and have optimum growth temperatures of 70°C or higher are called

a) psychrotrophs b) psychrophiles

c) mesophiles d) thermophiles.

ii) The plasmid which confers drug resistance is

a) *F* plasmid b) Col plasmid

c) *R* plasmid d) Vine lent plasmid.

iii) Penicillin

a) inhibits protein synthesis by affecting 30S

subunits

b) inhibits cell wall synthesis

c) inhibits lysogenic infection

d) none of these.

iv) The site where Rec BCD nuclease binds to initiate the process of recombination is

a) Ori *C* b) Ori *T*

- c) Chi d) none of these.
- v) UV-A light causes DNA damage by creating
- a) cross linking between adjacent cytosine and thymine bases
- b) alkylation of bases
- c) hydrolysis of bases
- d) free radicals.
- vi) Which protein has an important role in cell division ?
- a) Fts Z b) Fts I
- c) Zip A d) Min D.
- vii) When microbes are inoculated into fresh medium they do not start to grow immediately because of
- a) lag phase b) log phase
- c) stationary phase d) exponential phase.
- viii) The compound which transports peptidoglycan precursors across the cytoplasmic membrane is
- a) Glycolase b) Transpeptidase
- c) Gescentin d) Bactoprenol.
- ix) The process in which single DNA strands are exchanged between two intercrossed molecules of duplex DNA and resolution, in which those two intercrossed molecules of DNA are cut apart and restored to their normal double stranded state is known as
- a) conformational proof reading
- b) branch migration
- c) holiday junction
- d) none of these.

- x) The substance that is characteristic of endospore but absent in vegetative cell is
- a) SASPs b) dipicolinic acid
c) both (a) and (b) d) none of these.
- xi) The natural function of restriction enzyme is to
- a) cut up foreign DNA b) remove introns
c) add nucleotide d) repair DNA.
- xii) Thirty-six colonies grew in nutrient agar from 1.0 ml of sample withdrawn from a solution diluted to 10^{-5} in a standard plate count procedure. How many cells were in the original sample ?
- a) 360 b) 360,000
c) 1,800,000 d) 3,600,000.

GROUP – B

(Short Answer Type Questions)

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

2. Define plasmid. Why is plasmid called an episome ?
Describe *F* plasmid in brief. $1 + 1 + 3$
3. What is bi-directional replication ?
4. Describe the stages of endospore germination with the help of diagrams.
5. Write short note on synchronous culture.
6. Nitrous acid can revert mutation. Justify.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. What are Mpf and Dtr system in plasmid transfer ? Discuss the steps for mobilization of plasmid from *F*⁺ and *F*⁻ cells

with proper diagram. What are Col plasmids ? Explain the role of Fts proteins in cell division. 4 + 5 + 2 + 4

8. Describe the techniques of total cell and viable cell counting.

How does hyperthermophile differ from a psychrophile ?

How does pH and osmotic pressure affect microbial growth ?

6 + 4 + 5

9. a) Write a short note on SOS response.

b) Differentiate between rolling circle model and Q-structure bidirectional replication.

c) How does impairment of proof reading in mutants occur ? 5 + 6 + 4

10. In DNA replication primer is needed. Why ? How replication is initiated and terminated in *E.coli* ? Write down the mechanism of decatination. 3 + 8 + 4

11. Differentiate between the photo-repair and dark-repair. How bromouracil acts as a mutagen ? Which type of repair is facilitated by the ree A genes ? Explain that repair.

6 + 4 + 5

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