

2012

M.Sc.

2nd Semester Examination

MICROBIOLOGY

PAPER—VIII (MCB-202)

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Answer any two questions from each group.

Group—A

(Microbial Genetics)

[Marks : 20]

Answer any two questions.

1. (a) Define Chromatin.
- (b) Describe the structural organization of bacterial chromosome in *E. Coli*.

(Turn Over)

- (c) What is supercoiling of DNA ? Mention the significance of negative supercoiling of DNA with special reference to regulation of gene expression.

1+4+(2+3)

2. (a) Define genomics. How does structural genomics differ from functional genomics ?

- (b) How is gene function assigned experimentally ? Briefly discuss the merits of such methods.

(1+2)+(2+5)

3. Write short notes on (any four) :

$2\frac{1}{2} \times 4$

(a) Restriction mapping ;

(b) Regulation of *trp* operon by attenuation ;

(c) Extra chromosomal genetic material ;

(d) Specialized transduction ;

(e) Reporter genes ;

(f) Antisense RNA.

Group—B**(Molecular Biology)**

[Marks : 20]

Answer any two questions.

4. (a) Describe the mechanism of prokaryotic DNA replication at the fork with neat diagram.

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- (b) What special problem would you expect in eukaryotic DNA replication after the removal of last Okazaki fragment ?

 $2\frac{1}{2}$

- (c) Mention the different types of DNA polymerases in eukaryotes with their specific roles.

 $2\frac{1}{2}$

5. (a) What are 'Spliceosomes'? State their roles in post-transcriptional modification.

1+3

- (b) State the roles of the following in translation :

- (i) Aminoacyl tRNA synthetase ;
- (ii) EF-Tu ;
- (iii) eIF2.

2+2+2

6. (a) State how heterochromatinization and transposition are related to gene expression. $2\frac{1}{2}$
- (b) 'Cyclin-Cdk' complex is the key target to the cancer researchers — justify. $2\frac{1}{2}$
- (c) State the common mechanisms of transformation of protooncogene into oncogene. $2\frac{1}{2}$
- (b) P⁵³ gene is called the 'guardian of the genome' — explain. $2\frac{1}{2}$
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