

2016

M.Sc.

2nd Semester Examination

MICROBIOLOGY

PAPER—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.

Illustrate the answers wherever necessary.

Group — A

(Microbial Genetics)

[Marks : 20]

Answer any two questions.

1. (a) What is competence?

(b) Explain dominant and recessive epistasis with example.

(Turn Over)

(c) What are the extrachromosomal genetic elements found in eukaryotic cells? Mention their significance.

(d) State the biological role of telomerase.

$2+3+(1+2)+2$

2. (a) Differentiate between genetic map and physical map.

(b) Compare dosage compensation in human and *Drosophila*.

(c) Briefly state about DNA-triple helix and its biological function.

(d) What are the different mode of molecular recombination?

(e) How many A and a alleles are present in a population consisting of 10AA, 15Aa and 4aa individuals? What are the allelic frequencies?

$2+2+3+1+2$

3. Write notes on (any four) :

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

(a) Polygenic traits ;

(b) Nucleoproteins ;

(c) Interrupted mating and its utility ;

(d) Karyotype ;

(e) Replicative transposable element ;

(f) Human genome project.

Group — B**[Marks : 20]****Answer any two questions.**

4. (a) "Eukaryotic gene regulation is a combinatorial regulation"— Justify.
- (b) What do you mean by epigenetic tag? Write its application in genetic analysis.
- (c) Explain the characteristics of "SOS repair" in DNA repair mechanisms of *E. coli*.

4+1+1+4

5. (a) Briefly elucidate the role of RNAi mediated gene silencing. Give example of siRNA mediated gene therapy.
- (b) What do you mean by positive control of operon in bacteria.
- (c) Mention the role of DNA gyrase in DNA replication.
- (d) What do you mean by photoreactivation?

(3+2)+2+2+1

6. Write short notes on *any two* :

5+5

- (a) Enhancer ;
 - (b) Klenow fragment ;
 - (c) Genomic Imprinting ;
 - (d) Attenuation in Trp operon ;
 - (e) Post-Transcriptional Gene Silencing (ITGS).
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