# M.Sc. 2nd Semester Examination, 2011

## MICROBIOLOGY

PAPER—VIII

*Full Marks* : 40

*Time* : 2 hours

Answer any two questions from each Group

*The figures in the right-hand margin indicate 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*) State Mendelian principles of heredity. Illustrate the chromosomal basis of segregation and independent assortment.

(*b*) Explain the law of DNA constancy and C-value paradox.

(*c*) Distinguish between constitutive and facultative heterochromatin. (2 + 3) + 3 + 2

2. (*a*) What is microarray and how it is used to study gene expression? Name two reporter genes commonly used in gene expression assay.

(*b*) What is antisense RNA? Mention briefly the role of antisense RNA in modulating m-RNA expression. (4 + 2) + (2 + 2)

3. Write short notes on (any *four*) : $2\frac{1}{2} \times 4$

(*i*) Specialised transduction

(*ii*) Positive regulation of *Lac* operon

(*iii*) Genetic map and Physical map

(*iv*) Base excision repair

(*v*) Retrosposons

(*vi*) Regulation of *Trp* operon by attenuation.

## GROUP—B

## (*Molecular Biology*)

[*Marks*: 20]

Answer any *two* questions

4. (*a*) Describe the molecular components of RNA polymerase with their specific role in *E. Coli* transcription.

   (*b*) Discuss the importance of different transcription factors in RNA polymerase-II regulated transcription. 5 + 5

5. (*a*) Briefly describe the different types of DNA damage.

   (*b*) Define mismatch repair.

   (*c*) Write down the basic principle of site Directed Mutagenesis. 4 + 3 + 3

6. (*a*) What are importance of $G_2 - M$ and $G_1 - S$ check points in cell cycle regulation? How $G_1 - S$ check point is associated to cancer development?

(*b*) State the roles of $p^{RB}$ in cancer development.

(*c*) Define Carcinogenic compound with suitable examples. $\left(2\frac{1}{2}+2\frac{1}{2}\right)+2\frac{1}{2}+2\frac{1}{2}$

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