2018

M.Sc. 2nd Semester Examination

MICROBIOLOGY

PAPER—MCB-203

Subject Code—31

Full Marks : 40

Time : 2 Hours

The figures in the 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

[20 Marks]

Answer any *two* questions. 2×10

1. (a) Enkaryotic gene regulation is an outcome of combinatorial control — justify. 3

   (b) How the whole gene sequence of E. coli can be mapped through conjugation ? 2

(c) You have isolated a protein which may bind with a DNA segment (1 kb). How will you design an experiment to prove the DNA-protein interaction ? 3

(d) What do you mean by gene expression and gene silencing ? 2

2. (a) State the role of C-AMP in positive control of lac-operon. 3

(b) Why lactose is not metabolized by E. coli when lactose and glucose both are present in the medium ? 3

(c) Write the significance of cis-tans test. 2

(d) Write four salient features of specilized transduction. 2

3. Write note on (any *two*) : 2×5

(a) Role of insulator and enhancer in gene regulation ;

(b) Attenuation control of trp operon ;

(c) Aptameric Regulation.

Group–B

[20 Marks]

Answer any *two* questions. 2×10

4. (a) Define continues quantitative variable with example.

(b) The average of a series of values is 20 and variance is 4. Determine the coefficient of variation.

(c) In a cross between black and white coat colored mice, the F_2 individual segregated into 787 black and 277 white coat colored mice. Perform the chi-square test to test wheather the results is in good agree with Mendelian 3 : 1 ratio or not. (critical chi-square value at df = 1 is 3.84 at $P < 0.05$) 2+2+6

5. (a) Define null and alternate hypothesis.

(b) Differentiate between unimodal and bimodal distribution with example.

(c) What is one-tail and two-tail t-test ?

(d) State the role of bioinformatics in biology.

(e) What is alignment ? 2+2+2+3+1

6. (a) Write in brief about biological databases. What are the major differences between rooted and unrooted tree.

(b) Write a short note on FASTA and BLAST.

3+3+(2+2)

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