

2008

MICROBIOLOGY

PAPER—VIII

*Full Marks : 40*

*Time : 2 hours*

Answer 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

[Marks : 20]

(Microbial Genetics)

Answer any two questions

1. Write short notes on (any five): 2x5
- (i) Petite mutant
  - (ii) Human genome project
  - (iii) G-banding
  - (iv) Non-histone protein
  - (v) Epigenetics
  - (vi) Restriction mapping
  - (vii) Specialised transduction.
2. (a) Write down the second law of Mendel and illustrate through proper diagram. Why first law is called as law of 'purity of gamete'?
- (b) Mention two ways through which expression of eukaryotic gene is regulated.
- (c) What is co-dominance? (3 + 2) + 3 + 2
3. (a) Define genomics? How structural genomics differs from functional genomics?
- (b) What is interrupted mating experiment? State its utility.

- (c) Absence of nuclear membrane in prokaryotes facilitates 'trp' operon in bacteria. Explain.
- (d) What is quantitative inheritance? Mention its utility. (1 + 2) + (1 + 1) + 3 + 2

GROUP—B

[Marks : 20]

(Molecular Biology)

Answer any two questions

1. (a) What is the role of a promoter in gene expression? Where are the promoters for bacterial polymerases located?
- (b) Describe the steps during initiation of transcription in bacteria. What is the role of  $\sigma$  factor?
- (c) Name the eukaryotic RNA polymerases, their location in the cell and the RNAs they synthesize. (2 + 1) + (3 + 1) + 3
2. (a) Mention the organelles responsible for post translational modification of a protein.

(b) How glycosylation occurs in a protein ?

(c) Write down mechanism of splicing occurs in an eukaryotic RNA.

(d) Explain heterochromatinization with an example. 1 + 3 + 4 + 2

3. Write short notes on (any four):

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

(i) Capping of pre-mRNA

(ii) SOS repair of damaged DNA

(iii) Primosome

(iv) Oligonucleotide-directed mutagenesis

(v) Role of t-RNA in protein synthesis

(vi) Genetic basis of cancer.

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