2009

M.Sc.

1st Semester Examination

BOTANY

PAPER—IV

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.

Write the answers to questions of each unit in separate books.

1. Answer any *five* of the following : 2×5

(i) Define thermal death time (TDT) and decimal reduction time (D) for the microbes.

(ii) What do you mean by pasteurization? How the process is carried out?

(iii) What is media? Is nutrient broth a 'universal' medium? Explain.

(iv) Why endospores are resistant to heat and harsh chemicals?

(v) What are the characteristics of an ideal chemotherapeutic agent?

(vi) Why is Bergey's Manual of Systematic Bacteriology so important to bacteriologists?

(vii) What is significance sequence? What is its importance in bacterial identification?

(viii) Can you have a plasmid devoid of genes? What is the function of Ti-plasmid?

2. Answer any *two* of the following : 5×2

(i) Define growth. Describe the four phases of the growth curve in a closed system and discuss the causes of each. 1+2+2

(ii) What are the generation or doubling time and the mean growth rate constant? How can they be determined from growth data?

Hints : (A bacterial population increases from 10^3 cells to 10^9 cells in 10 hours) 1+1+3

(iii) Briefly describe the nif gene regulation. 5

3. Answer any *two* of the following : 10×2

(i) (a) Describe the molecular architecture of peptidoglycan layer, gram-positive cell walls and gram-negative cell walls of bacteria. 2+1+1

(b) Describe the structure and mobility mechanism of a gram-negative bacterial flagella. 2+2

(c) Distinguish between fimbriae and sex pili and give the function of each. 2

(ii) (a) Define vector. Write the properties of a good vector and about any one recombinant vector. 1+2+2

(b) Write the properties and types of Restriction Endonuclease. How the DNA and Restriction endonuclease co-exist in a bacterial cell. 1+2+2

(iii) (a) How do the cro gene and CI gene regulate the lytic and lysogenic cycle?

(b) Schematically describe the Entner-Doudoroff Pathway of glucose catabolism. 6+4

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