(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 2 5 9

Exam. Code : 0 0 3

B.A./B.Sc. (General) 3rd Semester

1125

BIOTECHNOLOGY

Paper—BIOT-Elect-III-T : Introduction to Genetic Engineering and Immunotechnology

Time Allowed : Three Hours] **[Maximum Marks : 75**

Note :— (1) Students are required to attempt **five** questions in all.

(2) Attempt at least **two** questions from each section.

(3) Question No. **9** (Section C) is compulsory. All questions carry equal marks.

SECTION—A

I. (a) What are restriction endonucleases ? Differentiate between type I, II and III restriction endonucleases. Discuss the salient characteristics of type II restriction endonucleases.

(b) How will you purify plasmid DNA from Bacterial cells ? Explain any one method. 8,7

II. Write the source, mode of action and application of following enzymes :

(a) Bal31

(b) Dnase I

(c) T7 polymerase

(d) Reverse transcriptase.

(e) Polynucleotide kinase. 5×3

III. (a) What is a cosmid ? Discuss the role of in vitro packaging in cosmid construction.

(b) Explain Lambda insertion and replacement vectors. 10,5

IV. (a) Describe the various approaches for the identification and isolation of the recombinant clones carrying the desired DNA insert.

(b) What is PCR ? Discuss main features of primers required for PCR. Explain Hot start PCR. 8,7

SECTION—B

V. (a) Discuss the various innate immunity barriers and describe the major events in the inflammatory response.

(b) List two primary and two secondary lymphoid organs and summarize their functions in the immune response. 7,8

VI. (a) What are secretory immunoglobulins ? What role does IgA play in inducing mucosal immunity ?

(b) Explain Peptide binding by MHC class I and class II molecules. 7,8

VII. (a) Discuss the structure of an Immunoglobulin giving a well labelled diagram. Give function of each component.

(b) Write a note on Immunoelectrophoresis and its various types. 7,8

VIII. Write notes on :

(a) Adjuvants

(b) Subsets of T cells

(c) Antibody dependendent cell mediated cytotoxicity. 5×3

SECTION—C

IX. Write note/give reasons :

(a) Define Palindromic sequence.

(b) Give the difference between transfection and transformation.

(c) Why are glycerol and bromophenol blue added to the gel loading ?

(d) Exogenous and endogenous antigens.

(e) What would happen when you use only one primer in a PCR reaction ?

(f) Define Probe.

(g) Define Opsonization.

(h) Name the Granulocytic cells that relsease various pharmacological active substances and their role in immune response.

(i) Antigenic determinant.

(j) Pattern recognition receptors. 1.5×10