[This question paper contains 3 printed pages.]

1459 *Your Roll No.* .....

B.Sc. (Hons.) / III **A**

MICROBIOLOGY – Paper XV

(Recombinant DNA Technology and Biotechnology)

(Admissions of 2004 and onwards)

Time : 3 Hours *Maximum Marks : 60*

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt **Five** *questions in all.*
Q. No. **1** *is compulsory.*

1. (a) Name the technique/process commonly used for the following :

(i) To quantify the amplican

(ii) To study protein-protein interaction

(iii) To delay fruit ripening

(iv) To sequence a large eukaryotic genome

(v) To ensure bioethics in the innovations and research work in biological sciences

(vi) To transform a plant cell

P.T.O.

(vii) To treat patients with spinal injury

(viii) To detect environmental pollutants using microbes or their enzymes (1×8=8)

(b) Mention the enzymes, templates and primers used to amplify the genome of HIV. (4)

2. (a) What do you understand by an expression vector ? Discuss the commonly used promoters employed to construct such vectors. (6)

(b) Discuss the gene delivery method you would use to transform the following system. Justify your answer :–

(i) To produce knock out mice

(ii) For Gene therapy *in vivo*

(iii) To produce genetically engineered microorganisms (2×3=6)

3. Differentiate the following :–

(i) Subunit and Peptide Vaccines

(ii) DNA finger printing and DNA foot printing

(iii) Adaptor and Linker

(iv) Sister and helper-vector (3×4=12)

4. (a) Outline the steps involved in isolation and purification of plasmid DNA from a bacterial cell. Also mention the role of each of the chemicals used in the process. (6)

(b) According to you, which are the **three** most significant discoveries/inventions in recent times, in the field of biotechnology. Name the contributer/s and justify your answer. (3×2=6)

5. Write short notes on the following :

(i) Site directed mutagenesis

(ii) BLAST

(iii) Golden Rice

(iv) Gel-Shift Assay (3×4=12)

6. (a) Discuss any **one** genetically modified microorganism developed for the release into the environment. (4)

(b) Mention the host and vector used for the humulin production. Outline its production in the form of a flow chart. (6)

(c) Write a short note on RAPD technique. (2)