

[This question paper contains 6 printed pages.]

1925

Your Roll No. ....

B.Sc. Prog. / III

E

LS-304 : APPLIED BIOLOGY AND  
BIOTECHNOLOGY

(Admissions of 2008 & onwards)

Time : 3 Hours

Maximum Marks : 75

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

*Use separate answer-sheets for Section A and B.*

**SECTION A**

**(38 Marks)**

*Attempt **four** questions in all including  
Question No. 1 which is compulsory.*

1. (a) Expand and write the location of the following institutes (any **three**):

(i) IRRI

(ii) IFPRI

(iii) NBPGR

(iv) IARI

(3)

P.T.O.

(b) Match the following :

Column A	Column B
(i) Glyphosate	(A) Flavr Savr
(ii) Vector	(B) Insecticide
(iii) Tomato	(C) Herbicide
(iv) Restriction Enzymes	(D) <i>Drosophila melanogaster</i>
(v) Model organism	(E) Ti plasmid
	(F) <i>EcoRI</i> (5)

2. Write short notes on the following (**any two**) :

(i) Origin of hexaploid wheat

(ii) Reverse genetics

(iii) Green revolution (10)

3. (a) Describe the use of recombinant DNA technology in developing insect resistant plants. (5)

(b) Define the following terms (**any five**) :

(i) Transcriptome

- (ii) Vicarious domestication
  - (iii) Plasmid
  - (iv) Harvest index
  - (v) Gene pool
  - (vi) Contig
  - (vii) Scaffold (5)
4. Briefly explain **any two** of the following :
- (i) Antisense RNA technology in fruit ripening
  - (ii) Industrial production of amino acids
  - (iii) Comparative genomics
  - (iv) Food borne diseases (10)
5. (a) Why is *E. coli* considered as model organism for research ? (5)
- (b) Briefly explain the role of plants as bioreactors. (5)

6. (a) The soil *bacterium Agrobacterium* is considered to be a natural genetic engineer of the plants. Comment. (5)
- (b) Discuss the steps in ordered clone sequencing. (5)

**SECTION B (37 Marks)**

*Attempt three questions from Section B, including Question No. 1 which is compulsory.*

1. (a) Define :
- (i) Selectable marker
  - (ii) Contig
  - (iii) Fomite
  - (iv) Prophage (4)
- (b) Differentiate between :
- (i) Dendrogram and Cladogram
  - (ii) Extrinsic and intrinsic incubation period
  - (iii) Gene and genome (3)
- (c) Expand the following :
- (i) PFGE

(ii) BLAST

(iii) BAC

(iv) SNP (2)

(d) Give the contribution of the following :

(i) Sanger

(ii) Wilmut (2)

(e) Give the scientific names of the pathogen transmitted by the following vectors :

(i) *Culex fatigans*

(ii) *Aedes aegyptii* (2)

2. Discuss the life cycle and pathogenesis of infection caused by *Wuchereria bancrofti* in man. Give the role played by the vector in the transmission of the pathogen. Write a note on measures that can be directed towards the vector for disease control.

(12)

3. (i) What are the techniques used for molecular diagnosis of genetic disorders ?

(ii) Give an account of "DNA Fingerprinting-Technique and Application". (6,6)

4. Write notes on any **two** of the following :

- (i) Human genome project
- (ii) Chain termination method of DNA sequencing
- (iii) *Drosophila melanogaster* as a model organism  
for research studies (6,6)