Agriculture and Forestry University
Office of the Controller of Examination
Rampur, Chitwan
2079, *Month*

Faculty	Agriculture		
Exam	Regular		
Level	Bachelor	Full Marks	40
Program	B. Sc. Ag.	Pass Marks	16
Year and semester	2nd year, 4th semester	Time	2:00 hrs.

Subject:- PLB 202, 3(2+1) Introductory Plant Breeding

Candidates are required to give their answers in their own words as far as practicable. All questions carry equal marks. Answer any 10 questions.

1. What is meant by gene pool ? Why is germplasm collection and conservation necessary ? (2 + 2)
2. Discuss in brief the “uniculm theory” of plant ideotype in relation to breeding of small grain and cereal crops. What are the features of an ideal genotype of maize ? (2 + 2)
3. What is DUS test ? What is it’s relevance in varietal release and registration program ?
4. Describe multiple factor hypothesis with example as described in experiment by Nillson-Ehle. (4)
5. The phenotypic variance of yield in maize 200 kg^2 per acre. The variance within an inbred line is 80. The regression of offspring phenotype on mid parent values is 0.32. Find additive variance, genetic variance, environmental variance, narrow sense heritability and broad sense heritability.
6. Demonstrate the segregation mechanism in relation to gamete types, gamete frequencies and offspring phenotypes in a self-fertilization of an Autotetraploid “Aaaa” genotype.
7. Write short notes on (any two): (2+ 2)
    a. Plant breeder’s rights
    b. Xenia effect
    c. Wide crossing
8. Describe how a recessive gene for disease resistance can be transferred from wild germplasm of rice to an adapted commercial variety. (4)
9. How can polyploids be produced ? What are the factors affecting the success of mutation breeding ? Describe. (2 + 2)
10. Explain with a hypothetical example the genetic basis of heterosis. (4)
11. Describe in detail the 3 line system of producing hybrid rice. (2 + 2)