

THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME – LEVEL 05
FINAL EXAMINATION – 2007/2008
BOTANY
BTU 3111/BTE 5111 – PLANT BREEDING
DURATION : TWO AND A HALF (2 1/2) HOURS



095

DATE : 16th June 2008

TIME : 1.30 – 4.00 p.m.

ANSWER ANY FOUR (04) QUESTIONS.

1.
 - a) What are the adopted practices in seed production of a new variety ?
 - b) Describe the various classes of seeds that are recognized by seed certification agencies.
 - c) Out-line the procedure by which a new variety reaches the farmer.
 - d) Describe how a variety is certified.

2.
 - a) Whether a plant is predominantly selfed or predominantly outcrossed will depend on several factors.
 - i) What are these factors?
 - ii) Give a brief account of each factor.
 - b) What is male sterility? Explain.

3.
 - a) Several types of selection methods are practiced for cross pollinated plants. What are they?
 - b) What is recurrent selection?
 - c) Name the four (04) types of recurrent selection and explain them.
 - d) Use a flow chart to explain the main steps in Simple recurrent selection.

4. a) How does quantitative inheritance differ from qualitative inheritance ?
- b) What is heritability?
- c) Two homozygous varieties of tomato were crossed to produce F_1 hybrids. The average phenotypic variance in yield of the three populations P_1 , P_2 and F_1 , was 10.60. The variance of F_2 was 20.60.
- i) Calculate the heritability of yield in the F_2 population.
- ii) Do you think that subsequent selection in future generations would be successful in further changing the yield in tomato?
- d) How does heritability become useful in a breeding programme ?
5. a) Asexually propagated plants have a varied nature of propagation. What are the different breeding methods identified for these plants ?
- b) A clone is always propagated and maintained vegetatively. This is the main way by which a clone differs from the pure line of self pollinated crops and inbred of cross pollinated crops.
Give the main differences among pure line, inbred and clone.
- c) i) Give an account of the procedure of clonal selection of asexually propagated plants.
- ii) What are the advantages and drawbacks of clonal selection?
6. a) What is hybridization ?
- b) What is Hybrid Vigour?
- c) Explain briefly how hybrid vigour is utilized in a breeding programme.
- d) i) Use a flow chart to explain the **Modified Bulk** method of breeding a self pollinated crop.
- ii) Give a comparison of pedigree and **bulk** methods of breeding self pollinated crops