

THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME – LEVEL 05
FINAL EXAMINATION – 2011/2012
BOTANY
BOU 3106/BTU3111/BTE 5111 – PLANT BREEDING



DURATION : TWO (02) HOURS

DATE : 28. 11. 2012

TIME : 1.30 – 3.30 p.m.

ANSWER ANY FOUR (04) QUESTIONS

1.
 - a) What are the practices adopted 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) 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 line of cross pollinated crops.
Give the main differences among pure line, inbred line and clone.
- c)
- Give an account of the procedure of clonal selection of asexually propagated plants.
 - What are the advantages and drawbacks of clonal selection ?

4.

- a) What is Hybrid Vigour ?
- b) Explain briefly how hybrid vigour is utilized in a breeding programme.
- c)
- Use a flow chart to explain the **Modified Bulk** method of breeding a self pollinated crop.
 - Give a comparison of **Pedigree** and **Bulk** methods of breeding self pollinated crops

5.

- a) What is heritability ?
- b) Two homozygous varieties of wheat 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 12.20. The variance of F_2 was 22.20.
- Calculate the heritability of yield in the F_2 population.
- c) In rice, the inbred lines, L1, L2, L3, L4 and L5 were crossed in all possible combinations in a diallel cross. The progeny produced the following data for the yield.

	L1	L2	L3	L4	L5
L1	30	32	41	31	30
L2	40	39	41	34	32
L3	41	38	41	35	35
L4	31	40	38	34	29
L5	31	33	30	26	19

- i) Calculate the General Combining Ability (GCA) of each line.
- ii) Select the best line for GCA.

6.

- a)
 - i) What is somoclonal variation ?
 - ii) What are the factors that affect somoclonal variation ?
- b) Explain how somaclonal variation can be utilized for crop improvement.
- c) What are the advantages and disadvantages of applying somoclonal variation in crop improvement ?

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