



"Investing in Africa's Future"

FACULTY OF AGRICULTURE AND NATURAL RESOURCES

ACP305: PLANT BREEDING AND BIOTECHNOLOGY

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2016

LECTURER: DR. Z. A. CHITEKA

DURATION: (3HRS)

INSTRUCTIONS

1. Do Not Write Your Name On The Answer Sheets.
2. Use Answer Sheets Provided.
3. Begin Your Answer For Each Question On A New Page.
4. Credit Is Given For Neat Presentation Of Answers.



ACP 305 PLANT BREEDING AND BIOTECHNOLOGY

Answer five questions

- 1a. A farmer grew a commercial crop of maize using the hybrid cultivar SC403 and harvested seed and used this seed the following season. Discuss this practice and explain why it is discouraged. [4]
- 1b. Maize breeding in Zimbabwe moved away from single hybrids to three-way cross hybrids. Discuss. [4]
- 1c. Discuss the key processes in the development of a synthetic cultivar [4]
- 1d. Explain the modified single cross cultivar and give the advantages over a single cross. [4]
- 1e. Double cross hybrids are not widely deployed in maize cultivar improvement. Explain why. [4]
2. Describe the use of the pedigree method for genetic enhancement of maize inbred lines in a breeding program. [20]
3. Discuss the bulk population breeding method for the improvement of cultivars of barley and explain the genetic basis of the method. [20]
4. A single hybrid is made between two pure lines for a self pollinated crop. The F₁ is then selfed for six generations. Discuss the genetic consequences and explain how these impact on breeding methods for self and cross pollinated crops. [20]
5. Multi location testing over years and season is a prerequisite for the release of improved cultivars. Explain what this means discuss the genetic basis of this requirement. [20]
6. What are transgenic crops? Discuss the pros and cons of the deployment of transgenic crop cultivars and explain the basis of the controversy of the use of these types of cultivars.