AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

NACP 112: AGRICULTURAL BOTANY AND PLANT PHYSIOLOGY

END OF SECOND SEMESTER FINAL EXAMINATIONS

MAY 2021

LECTURER: MR. MTAITA T. A.

DURATION: 7 HOURS

INSTRUCTIONS

1. Answer one question only
2. Download the question paper and work off line
3. Upload your answer in PDF format

Question One

a) Write about plant growth regulators restricting your write-up to:

i) Meaning and groups of plant growth regulators. **[10]**

ii) Bioassays. **[15]**

iii) Commercial uses of each identified group of plant growth regulators. **[15]**

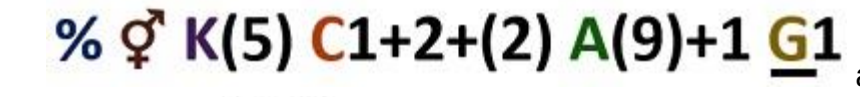
b) Examine the concept of pollination in plants and illustrate different mechanisms that favor or limit cross and self-pollination. **[20]**

d) With reference to the primary functions of major plant organs, discuss the different types and functions of modified plant organs. **[20]**

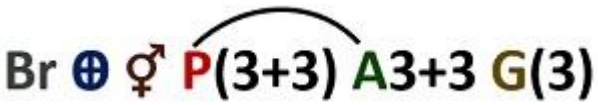
e) Analyse the concept of vernalisation in agriculture science. **[20]**

Question Two

a) With clear elaborations, clarify how scientific names are presented in agriculture science. **[5]**
b) Scrutinize the functions of the primary and modified plant organs. **[10]**
c) Interpret the following two floral formulas. **[10]**



and



d) Clearly examine why agriculture students bother to study plant botany. **[5]**
e) With the aid of realistic examples, write about botanical and operational plant classification in agriculture science. **[30]**
f) Examine different plant growth stages and suggest the management practices for each stage for the farmers' benefit. **[20]**
g) Provide physiological explanations for each of the following observations **[20]**

i. Groundnuts (*Arachis hypogea*) flowers are formed above the soil surface but their fruits are formed underground.
ii. Pineapples (*Ananas comosus)* thrive under limited water supply while paddy rice require abundant water supply for their growth and development.
iii. Sphagnum moss is used as a potting media in horticulture.

iv. Both paddy and upland rice require the same amount of nutrients but less nitrogenous fertilizer is applied to paddy rice than to upland rice.

v. The banana plant grows up to three meters tall with the apical meristem still underground.

vi. The classification of angiosperms is based very largely on floral structure.

vii. Farmers in Zimbabwe grow spring wheat instead of winter wheat cultivars, during the winter season.

viii. Auxins promote shoot and root growth but synthetic auxins are used as herbicides in agriculture.

ix. Green and mature bananas are treated with ethrel about five days before marketing.

x. *Sphaceloma manihoticola* causes 'super elongation' disease in cassava.

Question Three

a) For each of the following systems of pollination control; state and explain whether it encourages or enforces self or cross-pollination (or self- or cross-fertilization).

1. Cleistogamy **[2.5]**
2. Monoecy **[2.5]**
3. Dichogamy, and **[2.5]**
4. Heteromorphic sporophytic incompatibility **[2.5]**

b) If you are charged with the responsibility of teaching a botany course during your attachment at an agricultural college, prepare elaborate notes to students who want to understand about the following:

I) Scientific names. **[5]**
II) Plant classification. **[5]**
III) Factors influencing photosynthesis. **[5]**
IV) Why Gibberellins are used in barley malting. **[5]**
V) Floral formulas. **[5]**
VI) Transpiration and anti-transpirants. **[10]**
VII) Functions of primary and modified plant organs. **[15]**
VIII) Pollination and pollination agents. **[10]**
IX) Photoperiodism. **[10]**

c) Given a complete plant (with stems, roots, leaves, flowers, etc.) HOW CAN YOU TELL whether the plant:

i. Belongs to the family ASTERACEA or not **[2]**
ii. Has complete or incomplete flowers **[2]**
iii. Has a marginal or parietal placentation **[2]**
iv. Has a rhizome or a corm **[2]**

v.	Is likely to be wind or insect pollinated	**[2]**
vi.	Belongs to the family POACEAE or FABACEAE	**[2]**
vii.	Is an angiosperm or gymnosperm	**[2]**
viii.	Has a racemose or cyme inflorescence	**[2]**
ix.	Is monoecious or dioecious	**[2]**
x.	Is a monocot or a dicot.	**[2]**

End of Examination Paper