AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

ACP 203 PRINCIPLES OF CROP PRODUCTION

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2021

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INSTRUCTIONS

This exam has three questions. Choose ONE of the questions, then answer ALL parts of the question that you choose.

Do NOT include the questions in your answer sheet. Write **only** the answers.

If you have calculations, drawings and/or graphs as part of your answer, you may do them on a separate paper, photograph them, and insert the photo in your document.

NACP213 PRINCIPLES OF CROP PRODUCTION END OF SEMESTER EXAM

It is important that you do your own work and use your own words. Copying and pasting from on-line sources or soft-copies of other resources (hand-outs, e-books, lectures, etc.), or from other student's work, will result in serious loss of marks. For questions involving calculations, show your work.

Question 1.

a. Zimbabwe should reduce the amount of imported fossil fuel used for agriculture.
Use your understanding of farming systems in Zimbabwe and of how energy is used and produced in Agriculture to discuss the above statement. (30 marks)

b. Use the principles involved in determining the Centers of Origins of crops to explain how scientists might prove that Bambara nut is native to West Africa. (20 marks)

c. Give the Latin (scientific/binomial) name for a crop that matches each of the following criteria. One example is given:

Characteristics	Latin name
Solanaceous fruit crop	*Lycopersicon esculentum*
Pulse with seeds that develop in pods below ground that is very drought resistant	i
Non-cereal energy crop that is not a root or tuber	ii
Cereal that is often transplanted	iii
Pulse with protein of 38%	iv
Legume that typically yields 10-20 t/Ha	v
Common name includes 'bean' but it is not a legume	vi
The flower bud is the most important organ harvested	vii
Non-cereal energy crop that does best in a cool environment	viii
Cereal with 6-7% protein content	ix
Temperate-area crop grown for sugar	x

(10 marks)

End of Question 1

Question 2.

A farmer named Livia has a plot which is 40 m by 55 m. The soil has a high percentage of sand. She planted maize with a *target* population of 45000 plants per Ha. Each plant yielded 0.9 cobs per plant. The total harvested was 7000 cobs (grain+cob) which weighed a total of 888 kg. She weighed a sample of 18 cobs, shelled them, and weighed the grain and came up with the following:

Grain+cob= 2.8 kg;
Grain only = 2.3 kg

a. Calculate her yields and compare them to *typical* yields and *high* yields in Zimbabwe . . (6 marks)

b. Give the **most likely** reasons why her yields might be different from *high* yields in Zimbabwe. (6 marks)

c. Advise her concerning:

i. Plant population-

how her population compared with her target population (4 marks)
how she might have corrected for an incorrect population (6 marks)

ii. Explain how the texture of her soil will affect the: (12 marks)

depth of sowing
base dressing fertilizer used
frequency of nitrogen top dressing
irrigation

iii. How to use Integrated Pest Management to reduce pests in her plot. Be specific. . (20 marks)

d Explain Vavilov's Theory of Crop Origins and why it is important for present-day crop scientists. (6 marks)

End of Question 2

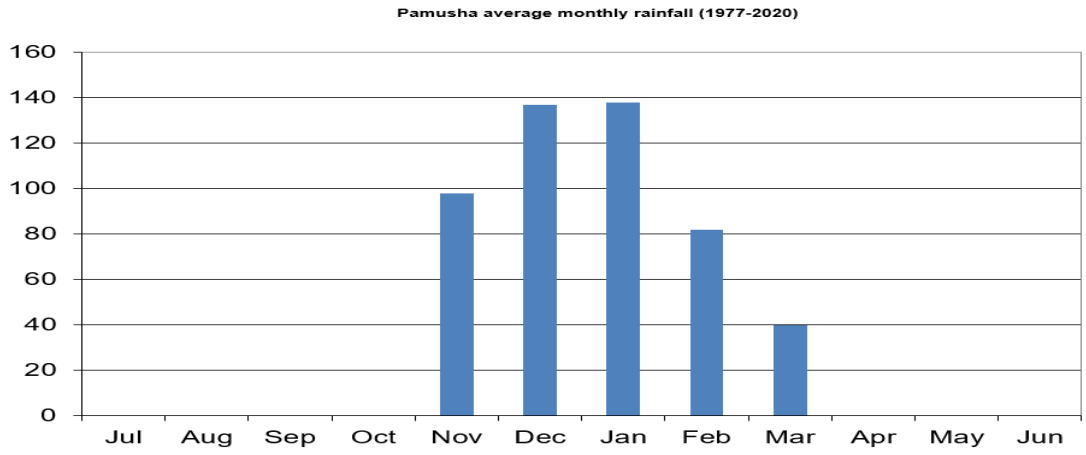
Question 3.

a. Both sweet potatoes and potatoes were planted in the plots on campus. Discuss the differences between the two crops under the following headings: (18 marks)

- Latin name and botanical family
- Plant parts harvested
- Growth habits
- Comparison of potential yields
- Suitability for low management systems in Zimbabwe, giving reasons

b. A village called Nyamhuri in Zimbabwe has the average rainfall in the graph below.

Its elevation (900 m) is less than that of Old Mutare (1100 m).



i. ***Compare*** the suitability of the following crops to this area, considering *both* temperature and rainfall: . (18 marks)

- Taro
- Wheat
- Pearl Millet
- Different varieties of Seedco maize
- Rice

ii. Discuss other factors which must be considered when selecting which of the above crops to grow at this location. (8 marks)

iii. The Pioneer maize variety PNR30G19 matures in 130 days at the AU campus. How many days will it take to mature at Nyamhuri? Justify your answer. (2 marks)

Q3 is continued on the next page.

Q3 (continued)

c. Linos planted a 15 Ha field of maize with rows spaced 90 cm apart. His target population was 45,000 plants per hectare.

- After the crop emerged, Linos measured 8 meters of four separate rows, and then counted the number of plants in each with the results:
- Row1- 22 plants Row2- 26 plants Row3- 26plants Row4 28 plants

a. What can you tell him about how his actual population compared to his target population? Show your work. (6 marks)

b. What advice can you give him about how to improve the population in his present field, giving reasons why he should? (6 marks)

c. How many total bags (50 kg) would be considered a very good yield for Linos' field? (2 marks)

End of Question 3

End of Exam