



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF BUSINESS

DEPARTMENT OF COMERCE

UNIVERSITY POST GRADUATE EXAMINATION

2018/2019 ACADEMIC YEAR

**FIRSTYEAR ONE SEMESTER EXAMINATION FOR, MSC IN
AGRICULTURE ECONOMICS**

AEC 604- OPERATIONS RESEARCH

DURATION: 3 HOURS

DATE: 8/5/19

TIME: 9-11

Instructions to candidates:

1. Answer any four questions
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

QUESTION ONE (25 MARKS)

- a) Define operations management (5marks)
- b) Distinguish between operations management and operations research management science. (5marks)
- c) Within the operations function, managerial decisions have been divided into three broad levels. Explain using relevant examples. (5marks)
- d) Evaluate the importance of operations management education in modern business environment. (5marks)
- e) Explain the phrase operations strategy, giving examples of decisions that relate to it.(5marks)

QUESTION TWO (25 MARKS)

A company is involved in the production of two items(x and y).The resources needed to produce x and y are twofold, namely machine time for automatic processing and craftsman time for hand finishing. The table below gives the number of minutes required for each item.

	Machine time	Craftsman time
Item x	13	20
Item y	19	29

The company has 40 hours of machine time available in the next working week but only 35 hours of craftsman time. Machine time is costed at Us\$10 per hour worked and craftsmen time is costed at Us\$2 per hour worked. Both machine and craftsmen idle times incur no costs. The revenue received for each item produced (all production is sold) is Us \$20 for x and Us\$30 for y. The company has a specific contract to produce 10 items of x per week for a particular customer. Formulate the problem of deciding how much to produce per week as a linear programme and define decision variables, indicate objective function, constraints and sign restrictions.

QUESTION THREE (25MARKS)

- a) Explain any four common features of organisations (10marks)
- b) Discuss the advantages and disadvantages of the matrix structure of organisations.(10marks)
- c) Discuss the current business and management issues that may influence or affect the decisions made by operations managers. (10marks)

QUESTION FOUR (25 MARKS)

- a) Distinguish by use of appropriate examples between order winners and order qualifiers. (10marks)
- b) Critically examine how a modern business enterprise can build competitive advantage over its competition. (15marks)

QUESTION FIVE (25 MARKS)

You are given data on the following variables:

Government spending

Planned investment

Net exports

Autonomous taxes

Income tax rate

Marginal propensity to consume

- a) Consumption (c) is 600 when income (Y) is equal to 1,500. solve for autonomous consumption (5marks)
- b) Solve the equilibrium level of output in the following two scenarios:
i. There is an income tax=0.1
ii. There is no income in the economy.
Denote these two variables by Y_w^* and Y_{wo}^* respectively. (5marks)
- c) In the economy with an income tax of 10%, what is the budget balance of the government?(5marks)
- d) Solve for the change in net exports that would bring the equilibrium output level in the economy with the income tax to the level Y_{wo}^* that you found in (b). Specify both the magnitude of the change and whether it is an increase or decrease. What would be the new level of net exports after this change?
(5marks)
- e) Suppose that we would like to achieve the same goal as in part (d) by changing the level of autonomous taxes changes instead. Find the necessary magnitude of the change and specify whether autonomous taxes would have to increase or decrease. What would be the new level of autonomous taxes that accomplish the goal? (10marks)