



# **MURANG'A UNIVERSITY OF TECHNOLOGY**

## **SCHOOL OF BUSINESS AND ECONOMICS**

DEPARTMENT OF COMMERCE

UNIVERSITY ORDINARY EXAMINATION

2021/2022 ACADEMIC YEAR

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR, DIPLOMA IN  
BUSINESS MANAGEMENT.**

AMS 050– QUANTITATIVE TECHNIQUES

DURATION: 2 HOURS

### **Instructions to candidates:**

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

**SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION**

**QUESTION ONE (30 MARKS)**

- a) List any Five types of functions. (5Marks)
- b) Highlight Five properties of a determinant. (5Marks)
- c) What is the slope of the \*\*\*\*\* joining the points  $(X,Y) = (2,5)$  and  $(X,Y) = (5,18)$ . (5Marks)
- d) Find the following:
  - i. \*\*\*\*\*  $23dx$
  - ii. \*\*\*\*\*  $r2dx$

Where r is a variable independent of Xs thus it is treated as a constant. (5Marks)

- e) List Five ways of specifying sets. (5Marks)
- f) Highlight any Five \*\*\*\*\* of probability. (5Marks)

**SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION**

**QUESTION TWO (20 MARKS)**

- a) Pioneer manufactures 3 models of stereo receivers, 2 cassettes decks, 4 speakers and 3CD carousels. When the 4 types of compatible are sold together they form a system. How many different systems can the \*\*\*\*\* firm offer. (10Marks)
- b) Consider a product with the following data:

$$P = 200\text{Ksh}$$

$$Y = \text{Sh.}140$$

$$F = \text{Sh.} \text{*****}$$

- i. Required: Determine the Break even sales units. (5Marks)
- ii. The sales units required to make profit of sh.200,000. (5Marks)

**QUESTION THREE (20 MARKS)**

- a) \*\*\*\*\* and average cost function for a given firm are given a:

$$AR = \text{*****}$$

$$AC = 4/Q + 2 - 0.3Q + 0.05Q \text{*****}$$

Required: Find the \*\*\*\*\* of Q and P that would max the profit and \*\*\*\*\*

(10Marks)

- b) In a certain country there are two daily newspapers. The citizen and the mirror. A researcher interested in the reading habit of this country found the following: of the readers who read citizen on a given day 50% do so following day while the rest change to the Mirror. Of those who read Mirror on a given day 40% change to the Citizen following day. Yesterday the readership levels were 30% Citizen and 70% Mirror. Assume all conditions hold.

Required:

- i. Determine the readership levels of both dailies. (5Marks)
  - a) Today
  - b) Tomorrow
- ii. If this process persists long enough, what will be the eventual readership? (5Marks)

**QUESTION FOUR (20 MARKS)**

- a) There are 10 numbers, 0 through to 9 which are being used in code group of four to identify an item of clothing e.g code 1083 is to identify blue blouse, code 1030 is to identify a pair of socks and so on. Repetition of numbers is not permitted i.e same numbers can't be used twice or more in a total sequence e.g 2256 or 2872; How many different code groups can be designed? (10Marks)
- b) Assume that you have just invested Ksh.100,000. The investment is expected to earn interest at a rate of 20% compounded annually. Find the future value of the investment after 3 years. (10Marks)