



The Co-operative University of Kenya

END OF SEMESTER EXAMINATIONS AUGUST-2018

**EXAMINATION FOR THE DIPLOMA IN CO-OPERATIVE MANAGEMENT
(YR II SEM II)**

UNIT CODE: COCM 1213

UNIT TITLE: QUANTITATIVE METHODS

DATE: 27TH AUGUST, 2018

TIME: 11:30 AM – 1:30 PM

INSTRUCTIONS:

- Answer question **ONE (compulsory)** and any other **TWO** questions

QUESTION ONE

- a) Define the following as used in Network Analysis
- Dummy Activity (2 Marks)
 - Slack Variable (2 Marks)
 - Linear Programming (2 Marks)
- b) Solve the following system simultaneous equations using inverse method (6 Marks)
- $$\begin{aligned} 2x-y &= 9 \\ x+3y &= -6 \end{aligned}$$
- c) Let $A = \begin{pmatrix} 2 & 2 \\ 3 & -3 \end{pmatrix}$
- Find A^2 (3Marks)
 - Find the inverse of matrix A (3 Marks)
- d) Find $\frac{dy}{dx}$ for
- $y = (x^2+3)(2x^3+x^2-3)$ (3 Marks)
 - $y = x^{-3}$ (2 Marks)
- e) Determine the critical value of the following functions and find out the critical value that constitutes a maximum
- $$y = x^3 - 12x^2 + 36x + 8 \quad (3 \text{ Marks})$$
- f) Explain the conditions that must be satisfied to use transportation (4 Marks)

QUESTION TWO

- a) Solve the following system of simultaneous equations using Cramer's rule
- $$\begin{aligned} 4x+y-5z &= 8 \\ -2x+3y+z &= 12 \\ 3x-y+4z &= 5 \end{aligned} \quad (6 \text{ Marks})$$
- b) Given the universal set $S = \{-4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7\}$ and other sets $A = \{2, 5\}$, $B = \{-3, -2, -1, 0, 1, 2, 3\}$, $C = \{3\}$, $E = \{0, 1, 2, 3, 4\}$ and $F = \{-3, -2, 0, 2, 7\}$. Compute
- A^c (2 Marks)
 - $(A \cup B) \cap F$ (3 Marks)
 - $(A^c \cap C) \cup E$ (3 Marks)
- c) Evaluate
- $\int_1^3 (3x^2 + 3) dx$ (3 Marks)
 - $\int_0^5 (x + 15) dx$ (3 Marks)

QUESTION THREE

- a) Given that $M = \begin{pmatrix} 1 & 3 \\ 4 & 2 \end{pmatrix}$. Find the inverse (4 Marks)
- b) The total revenue of a firm is given by the function:
 $TR = 10Q^2 - 200Q$
Determine the level of output(Q) that will maximize total revenue (3 Marks)
- c) Explain FOUR limitations in using diagrams in presentation of data (8 Marks)
- d) Determine the interquartile range and the median for the following data
8, 18, 10, 18, 14, 12, 4, 2, 12, 14, 16 (5 Marks)

QUESTION FOUR

- a) State FOUR qualities of a good questionnaire (4 Marks)
- b) A company has tendered for two contracts, A and B. The probability of winning contract A is $\frac{2}{3}$, and that of winning contract B is $\frac{3}{5}$. Determine the probability of winning
- No contract
 - At least one contract
 - Contract A or B
 - Contract A and B (8 Marks)
- c) State and explain FOUR rules followed when drawing a network diagram (8 Marks)

QUESTION FIVE

- a) The table below shows activities and duration for an information system project. Use it to answer the questions that follow

	Activity	Predecessor	Duration
A	Select prototype	-	5
B	Develop prototype	-	6
C	Testing	A	6
D	Review	B,C	15
E	Walkthrough	B,C	7
F	Final testing	E	5
G	Review	D,F	5

- Draw a network diagram to represent the activities (6 Marks)
 - Show the critical path of the project (2Marks)
- b) Explain FOUR limitations of relying on secondary data in business decision making (8 Marks)
- c) Highlight FOUR properties of a good measure of central tendency (4 Marks)