**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF BUSINESS AND ECONOMICS**

**SECOND YEAR SECOND SEMESTER EXAMINATIONS FOR BBA (WITH IT)**

**ABA 205(MANAGEMENT MATHEMATICS)**

**BUSIA LEARNING CENTRE**

***Answer Question One (*COMPULSORY*) any other TWO Questions.***

**QUESTION ONE**

1. Explain the following using relevant examples.
2. Identity matrix (1mk)
3. A matrix (1mk)
4. Transpose of a matrix (1mk)
5. Determinant of a matrix (1mk)
6. Adjoint matrix (1mk)
7. Inverse of a matrix (1mk)
8. Given matrix A= 2 3 and B= 1 -2 0

 4 5 2 3 -5

Required;

1. ⎮A⎮ (2mks) ii) A-1 (2mks) iii) AB (2mks) iv) BT (2mks)
2. Explain
3. Technological matrix (1mk)
4. Markov chain process (1mk)
5. Input output analysis (1mk)
6. Steady state equilibrium in Markov (1mk)
7. Use delta method/ First principle to determine the derivative of $y=x^{2}+5$ (6mks)
8. Sketch the following functions:
9. Exponential functions (1mk) ii) Logarithmic functions (1mk)

iii) Quadratic functions (1mk) iv) Linear functions (1mk)

1. Differentiate a constraint and a slack variable. (2mks)

**QUESTION TWO**

1. Solve for $x\_{1,}x\_{2}$ and $x\_{3}$ using matrix algebra. (12mks)

$5x\_{1}-2x\_{2}+x\_{3}$=15

$2x\_{1}+3x\_{2}-x\_{3}$=7

$x\_{1 }+x\_{2}+2x\_{3}$=8

1. Explain the properties of matrices using examples (8mks)

**QUESTION THREE**

1. Given $\frac{3x+8y}{4x+7y}$ find;
2. $\frac{∂Z}{∂X}$ (5mks) ii) $\frac{∂Z}{∂Y}$ (5mks)
3. i) Explain local maximum and local minimum using examples (5mks)
4. Explain any 2 assumptions of Markov Chain process. (5mks)

**QUESTION FOUR**

1. A simple economy of two sectors Agriculture and Livestock is as below:

|  |  |  |  |
| --- | --- | --- | --- |
| PRODUCER | USER | FINAL DEMAND | TOTAL OUTPUT |
|  | Agric  | Livestock  |  |  |
| Agric | 250 | 175 | 85 | 600 |
| Livestock  | 160 | 180 | 75 | 450 |

Required;

1. Determine technical coefficient matrix and explain it. (6mks)
2. Compute the total output factor for each sector. (8mks)

 **QUESTION FIVE**

A furniture company produces tables and chairs. The following information is available for the production process. Each table takes 3 hours of carpentry and 3 hours of varnishing. Each chair takes 4 hours for carpentry and 1 hour for Varnishing. During the current production period 120 hours of carpentry and 100hours of vanishing is available. Each table sold yields a profit of £80 and each chair £40.

1. Formulate the problem as L.P (10mks)
2. Describe the properties of matrix determinants using examples (10mks)