****

**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2020/2021 ACADEMIC YEAR THREE**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BUSINESS AND ECONOMICS**

**FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT**

**COURSE CODE: ECO 312**

**COURSE TITLE: MATHEMATICS FOR ECONOMISTS**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 07/04/2021 TIME: 3.00-5.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of THREE (3) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. The growing value of profits of Tana café Hotel is given by ∏ (t) =500e1.5(3t1/2) Find the growth rate of profit at t=5 (8marks)
2. Consider the following national income model.

Y=C+I+G+X-M

C=100+0.6Y

I=50+0.15Y

M=40+0.01Y

G=120

X=80

Use Cramer’s rule to find the equilibrium income, consumption, investment and imports (**10 marks)**

1. Demonstrate Euler’s theorem for the following production functions
2. Q =AK2/5L8/5 **(4 marks)**
3. Q =AKaLβ **(4 marks)**
4. Given the following information: dC/dY = 0.73 +0.15Y1/2 and C=100 when Y=0 Calculate the consumption function **(4marks)**

**QUESTION TWO (20marks)**

1. Given that $Y=e^{X}4lnX^{2}$ Determine the derivative of Y with respect to X **(7marks)**
2. A firm that employs only labour (L=L (t)) for its production process pays a wage rate of W=W (t). Find the growth rate of its wage bill if the wage rate grows at 1.2% per annum and his wage employment increases by 0.5 %. **(7marks)**
3. The growth rate (V) of some asset is given by the function V=Bert Find the growth rate of value of this asset (6marks)

**QUESTION THREE (20marks)**

1. Given: y=uv where u=u(x) and v=v(x), show that the elasticity of y with respect to x is given by

εyx=εux +εv **(9marks)**

1. Find the inverse of Y=ln4x-13 **(6marks)**
2. If y=ln{g(x)}.Find dy/dx (5marks)

**QUESTION FOUR (20marks)**

1. Determine the partial elasticity of Q with respect to K and L given the following production function

Q=60K1/3L2/3 **(5marks)**

1. Given the following equations

Y= C +I

C= 200+0.7Y

I=8-0.3r

Md=100+0.25Y-200r

Ms=120

Find Y and r using Cramer’s rule **(10marks)**

1. Find dy/dx of the following functions
2. y = logb x **(2marks)**
3. y =loga g(x) **(3marks)**

**QUESTION FIVE (20marks)**

1. Consider the following bivariate utility function

U = 25x2/5y3/5

**Find**

1. The MUx and MUy **(6marks)**
2. MRCS between the two good **(4marks)**
3. Assuming that the rate of net investment flow is given by function presented below and that K (0) =30

*I(t)=24t2/5*

1. Find the time path of capital stock K(t) **(5marks)**
2. Find the amount of capital formation over the interval (1,4) **(5marks)**