MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
THIRD YEAR FIRST SEMESTER

SCHOOL OF BUSINESS& ECONOMICS
BACHELOR OF ARTS IN ECONOMICS

COURSE CODE: ECO312
COURSE TITLE: MATHEMATICS FOR ECONOMISTS

DATE: 20TH APRIL 2018   TIME: 1100 – 1300HRS

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<u>INSTRUCTIONS TO CANDIDATES</u>

Answer Question ONE and any other THREE questions

QUESTION ONE

a) Use an example to distinguish between differential and difference equations? **[4 Marks]**

b) If the probability of a discrete random variable X with space R_x = {1, 2, 3, ..., 12} is given by f(x) = k (2x-1). Use the properties of probabilities density functions to solve for k. **[6 Marks]**

c) Use the knowledge of differentiation to explain how you can determine maxima and/or minima for simple functions? **[7 Marks]**

d) State Euler's Theorem? **[4 Marks]**

e) Explain two types of integrals? **[4 Marks]**

QUESTION TWO

a) State the fundamental law of calculus? **[4 Marks]**

b) Use the fundamental law of calculus to find f(t) given that
$F(t) = \ln(t^4)$. **[8 Marks]**

c) Give one reason why this law is important to us. **[3 Marks]**

QUESTION THREE

Suppose you have an equation of the form
F(t,x,y)= ln (t⁴+x²+y³+2xy⁹)

a) Find the partial derivative with respect to all the independent variables? **[6 Marks]**

b) How can we interpret the partial derivatives obtained in a) above? **[4 Marks]**

c) Find the total derivative of this function? **[5 Marks]**

QUESTION FOUR

a) State the adding up theorem? **[3 Marks]**

b) Suppose you are given a total production function Q=(MPL)L+(MPK)k, where Q=Total Output, MPL= Marginal Product of labour, MPK=Marginal product of capital, L=Labour andk=Capital

  i) Obtain the value of marginal product of labour and capital? **[6 Marks]**
  ii) Find the value of output if price=P? **[6 Marks]**

QUESTION FIVE

Suppose the differential equation of proportional change is
dy/dt=ky

a) Derive the law of exponential growth and decay? **[8 Marks]**

b) Explain two areas where this law can be put to use in Economics? **[7 Marks]**

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