

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2016/2017**

THIRD YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF

BACHELOR OF MATHEMATICS AND COMPUTER

**SMA 2320: ANALYTICAL APPLIED MATHEMATICS I**

**DATE: JULY, 2017 TIME: 2 HOURS**

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO

QUESTIONS

**QUESTION ONE: 30 MARKS**

a. Classify the following partial differential equations by stating their orders.

 (5 marks)

 i. 

 ii. 

 iii. 

 iv. 

 v. 

b. Express in terms of Sine and cosine. (5 marks)

c. Classify the equation as hyperbolic, parabolic or elliptic

 (5 marks)

d. Prove the Gamma functions (Generalized Factorial Function). (5 marks)

 

e. Prove that what  (5 marks)

f. Show that  (5 marks)

**QUESTION TWO: 20 MARKS**

a. Classify the following pole’s as either elliptic, hyperbolic or parabolic:-

 i. where  (3 marks)

 ii.  (3 marks)

 iii.  (3 marks)

 iv.  (3 marks)

b. Proof = (8 marks)

**QUESTION THREE: 20 MARKS**

a. An elastic string of length 20cm and linear density 0.5cm per gram is fixed at the second end with a tension of 18 units. Its stretched on one side such that it forms a curve on the  plane with its string on axis at and and 

 i. Write down the pole governing the above mathematical problem. (2 marks)

ii. Write down the boundary conditions and the initial conditions for the

above physical problem. (2 marks)

iii. By solving the pole find the displacement at a point (6 marks)

iv. Find when at seconds. (2 marks)

b. Proof  (8 marks)

**QUESTION FOUR: 20 MARKS**

a. Solve the wave equation:- (10 marks)

 given that:-

 

b. Show the relationship between Gamma function and Beta function.

 (10 marks)

**QUESTION FIVE: 20 MARKS**

a. Express in terms of sine and cosine function . (5 marks)

b. Proof that  (5 marks)

c. Proof that  (10 marks)