



W1-2-60-1-6

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY  
UNIVERSITY EXAMINATIONS 2016/2017**

**THIRD YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**STA 2200: PROBABILITY AND STATISTICS II**

**DATE: APRIL 2017**

**TIME: 2 HOURS**

**INSTRUCTIONS:**

**ANSWER QUESTION ONE [COMPULSORY] AND ANY OTHER TWO  
QUESTIONS**

**QUESTION ONE**

- (a) State two conditions for a continuous real valued function  $f(x)$  to be a probability density function [2 marks]  
(b) Let the random variable  $x$  have the following probability density function

$x$	-1	0	1
$F(x)$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{7}{12}$

Let  $E[W(2)]$  denote the expected value of  $w(x)$ . Find

- (i)  $E(x)$  [2 marks]  
(ii)  $E[2x^2+x+1]$  [4 marks]  
(c) Let  $X$  be a random variable whose pdf is

$$f(x) = \begin{cases} \frac{e^{-1} x^x}{x^1} & x = 0, 1, 2, \dots \\ 0 & \text{otherwise} \end{cases}$$

- (i) Show that its moment generating function is given by  $e^{2(e^x-1)}$  [3 marks]  
(ii) Hence or otherwise obtain the mean and variance of  $X$  [5 marks]

- (d) Let  $f(x)$  be the pdf of a random variable  $x$

$$f(x) = \begin{cases} k(1-x)^2 & 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$$

# Jkuat Past Exam Question Probability And Statistics

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