

Mount Kenya



University

UNIVERSITY EXAMINATIONS 2014/15
SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS

UNIT CODE: BMA 2102: PROBABILITY AND STATISTICS II

AUGUST 2015 SERIES

SBASED

TIME: 2HR CATH

Instructions: Answer all questions

1. A continuous random variable X has a cumulative distribution function $F(x)$ given by

$$F(x) = \begin{cases} 0, & x < 0 \\ (2x - x^2), & 0 \leq x < 1 \\ 1, & x > 1 \end{cases}$$

- a) Show that $P(X < \frac{1}{2}) = \frac{3}{4}$ 3marks
- Find
- b) the interquartile range of X 4marks
- c) The probability density function $f(x)$ 2marks
- d) $E(X)$ 2marks
- e) The $\text{Var}(3X - 5)$ 4marks
- f) Moment generating function 4marks
2. Find the probability that five tosses of a fair die a 3 appears [9]
- a) At no time
- b) Four times
- c) At least twice
3. On a final examination in mathematics, the mean was 72 and the standard deviation was 15. [7]
- a) Determine the standard score of students receiving the grades 60, 93 and 72
- b) Find the probability of students between 60 and 93
- c) What is the percentage of students scoring less than 45
4. A fair coin is tossed 500 times. Find the probability that the number of heads will not differ from 250 by more than 10 [5]

