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

SCHOOL BASED

CATIDUE

Instructions: Answer all questions

1. The discrete variable X is such that P(X = x) = c 'the number on a biased die', and the p.d.f. of X is shown,

X	1	2.	3.	4.	5.	6.	7
P(X = x)	1	1	1	y.	1	1	
	6	6	5		5	6	-

Find

a)	The value of y,		
b)	The expectation of X		

2marks c) Standard deviation of X 3marks

d) Var(4X) 1 marks e) Find moment generating function

2. Brian is playing a board game in which he needs to throw a six with an ordinary die in

order to start the game. Find the probability that a) Exactly four attempts are needed to obtain a six 2marks b)

At least two attempts are needed, 2marks He is successful in throwing a six in three or fewer attempts, c)

2marks d) He needs more than three attempts to obtain a six

2marks e) If X is a random variable with probability p of a successful throw a six to commence the game. Find the mean and Variance of the distribution.

4marks f) Hence or otherwise obtain moment generating function 3marks

3. Obtain the moment generating function for the distribution $f(r) = \begin{cases} \frac{e - m}{r!}, 0, 1, 2, \dots \\ 0, \text{ otherwise} \end{cases}$

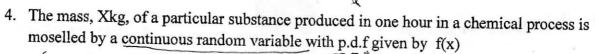
Hence or otherwise find the third moment about the mean

5marks

2marks

2marks





$$= \begin{cases} 0, x < 0 \\ 32, x^{2}, 0 \le x < 2 \end{cases}$$

$$= \begin{cases} 3(6-x) \\ 32, x \le 6 \end{cases}$$

- a) sketch the graph of the function f
- b) P(x < 4)
- c) Find the variance

2marks

3marks

5marks