



UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018

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COURSE NO: MA 277

COURSE NAME: PROBABILITY ANS STATISTICS II

CLASS: MA II

TIME: 3 HOURS

Name: _____ Index Number: _____

ANSWER ANY THREE QUESTIONS

Q1. (a) Suppose a random variable x with pdf given by $f(x) = \begin{cases} 6x(x^2 - 1), & 1 < x < 2 \\ 0, & \text{elsewhere} \end{cases}$

Find the mean, and standard deviation of the distribution.

(b) Let X have a Poisson distribution with p.d.f $f(x) = \frac{\lambda^x e^{-\lambda}}{x!}$, $x = 0, 1, 2,$

Determine the expectation of the random variable X

Q2. A random variable X, Y has pdf given by $f(X, Y) = \begin{cases} 8xy, & 0 < x < 1, 0 < y < 1 \\ 0, & \text{elsewhere} \end{cases}$

(a) Find the marginal and conditional probability density functions of X and Y . Are X and Y independent?

(b) Find (i) $p(-1 < X < 0.5 / Y = 0.5)$ (ii) $Var(3X + 7)$

Q3. (a) If X is a random variable of an exponential distribution with parameter $\lambda > 0$, find the moment generating function of X and obtain its variance.

(b) Given a normal distribution with $\mu = 30$ and $\sigma = 10$, find the probability that X assumes a value between 25 and 52.

Q4. The Table below gives the joint probability functions of $f(X, Y)$, of a discrete random variable X and Y .

(a) Find the value of M .

(b) Find the marginal probability mass functions of X and Y .

(c) Find (i) $p(X \leq 1, Y \leq 4)$ (ii) $f_{Y/X}(y / X = 2)$

Joint Probability Mass Function of X and Y

Y			
X \ Y	3	4	5
0	$\frac{1}{8}$	$\frac{1}{8}$	0
1	$\frac{1}{3}$	0	M
3	0	$\frac{1}{8}$	$\frac{1}{8}$

Examiner: C. C Nyarko/ Boye