LAGOS CITY POLYTECHNIC, IKEJA
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
2015/2016 SEMESTER EXAMINATION

COURSE TITLE: STATISTICAL THEORY II NO OF QUESTION: 6
COURSE CODE: STA 321 TIME: ALLOWED: 2HRS
FOR WHOM: HND YR I CS PT
INSTRUCTIONS: Answer any 4

Question

1. Give a discrete random variable X following a poisson distribution with parameter λ
   (a) Determine the maximum likelihood estimate of
   (b) Given observations 2, 3, 6, 8 and 11 obtain the maximum likelihood estimate of λ

2. Given a continuous random variable X following a Gamma distribution with parameters α and β
   (a) Explicitly write down the probability density of X
   (b) Obtain:
   (i) the first moment about the origin
   (ii) the second moment about the origin
   (iii) the variance of X

3. Suppose a continuous random variable X follows a Beta distribution with paremeters α and β
   (a) State the probability density function of X
   (b) Obtain
   (i) E(X) (ii) E(X2) (iii) V(X)

4. (a) State four properties of point estimator
   (b) Suppose a continuous random variable X follows a normal distribution with mean and variance σ^2

   Show that
   (i) X = EX / n is unbiased consistant estimator

   (ii) S^2 = Σ(x x)^2 / n-1 is unbiased consistent estimator

5. Given a discrete random variable X following a Bernoulli distribution with parameter P
   (a) Obtain the maximum likelihood estimator of P
   (b) Considering observation 2, 3, 6, 8 and 11, obtain the maximum likelihood estimate of P

6. (i) Define the rth moment (ii) About the origin (iii) About the mean