UNIVERSITY OF EDUCATION

"UExam" Semester-II, 2019

M.Sc Mathematics Session:2018-20

Course Code: MATH3120
Subject: Mathematical Statistics

No. 106

Roll No. (in fig.)________

Roll No. (in words)________

Candidate's Signature.________

Signature of Addl. Supdt.________

SECTION: I (MCQ's)

Time Allowed: 20 Minutes **Max. Marks: 18**

NOTE: Encircle the correct/ best answer in each of the followings. Each Question carries 1 mark. Use of remover carries zero mark. Cutting and Overwriting is not allowed.

Q1.

- All the cumulants of Poisson distribution are:
  a) $-\mu$ b) μ c) σ d) σ^2
- The formulae of *Poisson Process* is:
  a) $\frac{e^{-\lambda t}(\lambda t)^x}{x!}$ b) $\frac{e^{-\lambda t}}{x!(\lambda t)^x}$ c) $\frac{e^{-\lambda t}x!}{(\lambda t)^x}$ d) $-\frac{e^{-\lambda t}(\lambda t)^x}{x!}$
- For exponential distribution=?
  a) $\mu = \sigma$ b) $\mu \le \sigma$ c) $\mu \ge \sigma$ d) $\mu \ne \sigma$
- For uniform distribution, $E(X^2)$=?
  a) $\frac{a^2+ab+b^2}{3}$ b) $\frac{a^2+ab+a^2}{3}$ c) $\frac{a+b}{2}$ d) $\frac{(b-a)^2}{12}$
- For $\beta_1(m,n)$ when $0 \le x \le 1$, the F(x)=?
  a) $\int_{-\infty}^{\infty}\frac{1}{B(m,n)}.x^{m-1}(1-x)^{n-1}dx$ b) $\int_{0}^{x}\frac{1}{B(m,n)}.x^{m-1}(1-x)^{n-1}dx$
  c) $\int_{1}^{x}\frac{1}{B(m,n)}.x^{m-1}(1-x)^{n-1}dx$ d) $\int_{1}^{\infty}\frac{1}{B(m,n)}.x^{m-1}(1-x)^{n-1}dx$
- For the Poisson distribution, the $E(X^2)$ is:
  a) $\mu+\mu^2$ b) $\mu-\mu^2$ c) μ^2 d) μ
- Let X be a random variable with p.d.f. $f(x) = k(x-x^2), 0 \le x \le 1$ and 0 elsewhere, find k =?
  a) -6 b) 6 c) $-1/6$ d) $1/6$
- For $\mu_1' = 1,\ \mu_2' = \frac{6}{5},\ \mu_3' = \frac{8}{5}$, calculate μ_3 =?
  a) -2 b) 1 c) -1 d) 0
- The cumulant generating function of Gamma distribution is:
  a) $m\sum_{r=1}^{n}\frac{t^r}{r!}(r-1)!$ b) $m\sum_{r=0}^{\infty}\frac{t^r}{r!}(r-1)!$ c) $m\sum_{r=1}^{\infty}\frac{t^r}{r!}(r-1)!$ d) $m\sum_{r=0}^{n}\frac{t^r}{r!}(r-1)!$
- $n.(n-1)\Gamma(n-1)$ =?
  a) $\Gamma(n+1)$ b) $n\Gamma(n+1)$ c) $\Gamma(n-1)$ d) $\Gamma(n)$
- The Beta function is:
  a) *symmetric* b) *anti symmetric* c) *quadratic* d) *quartic*
- The variance of the hyper geometric distribution is:
  a) $\frac{np(N-n)}{N-1}$ b) $\frac{npq(N-n)}{N-1}$ c) npq d) $\frac{N-n}{N-1}$
- Two random variables X & Y are independent, if f(x, y) =:
  a) $h(y)$ b) $g(x)$ c) $g(x)h(y)$ d) $F(x,y)$
- $f(y_j|x_i)$ =
  a) $\frac{f(x_i,y_j)}{g(x_i)}$ b) $\frac{g(x_i)}{f(x_i,y_j)}$ c) $\frac{f(x_i,y_j)}{h(y_j)}$ d) $\frac{h(y_j)}{f(x_i,y_j)}$
- For the Poisson distribution, the $M_0(t)$ =?
  a) $-\mu(e^t-1)$ b) $\mu(e^t-1)$ c) $e^{-\mu(e^t-1)}$ d) $e^{\mu(e^t-1)}$
- The cumulant generating function of binomial distribution is:
  a) $n\log_e[q+pe^t]$ b) $n\log_{10}[q+pe^t]$ c) $\log_e[q+pe^t]$ d) $n\log_e[q+p]^t$
- $B\left(\frac{1}{2},\frac{1}{2}\right)$ =?
  a) $[\Gamma(4)]^2$ b) $[\Gamma(1)]^2$ c) $[\Gamma(\frac{1}{4})]^2$ d) $[\Gamma(\frac{1}{2})]^2$
- For $\mu_1' = 1,\ \mu_2' = \frac{6}{5},\ \mu_3' = \frac{8}{5},\ \mu_4' = \frac{16}{7}$, calculate μ_4 =?
  a) $\frac{3}{35}$ b) $-\frac{3}{35}$ c) $-\frac{35}{3}$ d) $\frac{35}{3}$