PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2019
(Third Semester)

Branch-STATISTICS

PROBABILITY AND DISTRIBUTION-II

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** marks (10x1 = 10)

The characteristic function of the binomial distribution for the binominal variate X~b(n,p)is :
(i) (q+pe“) (ii)$(p+qe^{.l})^n$
(iii) $(P+qe')^n$ (iv)$(q+pe^{II})^n$

A Poisson random variable has p_4=2, the value of its mean is
(i) X (U) $\frac{o}{o}$
(iii) (iv)

If a distribution has moment generating function Mx(t)=$(2-\overset{x\ o}{e})'$, then the distribution is
(i) geometric distribution (ii) Hyper geometric distribution
(iii) binomial distribution (iv) Negative binomial distribution

The distribution having the m.g.f. $\frac{1}{(3 — 2e^{*}>}$ **can be defined as**
(i) Negative binomial distribution (ii) Geometric distribution
(iii) Exponential distribution (iv) None of the above

The distribution function of a continuous uniform distribution of a variable X lying in the interval (a,b) is
(i) $\frac{1}{b-a}$ (ii) $\frac{X-a}{b-a}$
(iii) $\frac{b-a}{X-a}$ (iv) $\frac{X-b}{b-a}$

The range of exponential distribution is
(i) 0<x<oo (ii) X<0
(iii) oo<x$oo (iv) 0<x<l

The characteristic function of gamma distribution is
(i> **(ii>**
(iii) $(1-it)'^{l}$ (iv) None of these

The harmonic mean of Beta distribution of second kind
(0 $\frac{B}{v — 1}$ (ii) $\hat{}$ $\frac{B\sim1}{\mathbf{v-1}}$
(iii) $\frac{B-l}{}$ (iv) $\frac{B}{\mathbf{v}}$

9 If the sample size n=2, the Student’s t-distribution reduces to
(i) n-1 (ii) n

10 The skewness in a chi-square distribution will be zero if

(i) n^co (ii) n=0

(iii) n=l (iv) n<0

SECTION - B (35 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Ten coins are tossed simulatnaeously. Find the probabluty of getting (i) at least seven heads (ii) exactly seven heads and (iii) at the most seven eads.

OR

b Obtain the mean and variance of Poisson distribution.

12 a A machine is known to produce 3% defective items. What is the probability that at least 5 items are to be examined in order to get 2 defective items?

OR

b Define the following:

(i) Geometric distribution and (ii) Hyper geometric distribution

13 a State the importance properties of Normal distribution.

OR

b Show that the exponential distribution “Lacks of memory”.

14 a Determine the mean and variance of Gamma distribution.

OR

b Find the constant of Beta distribution for second kind.

15 a State and prove Additive property of Chi-Square distribution.

OR

b Bring out the applications of t-distribution.

SECTION - C (30 Marks!

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Find the mean and variance of Binomial distribution using MGF.

17 Prove that the recurrence relation for the moments of Poisson distribution.

18 Obtain the inflexion point for the Normal distribution follows N(0,1).

19 Derive the mean and variance of Beta distribution of first kind.

20 Derive the student’s t-distribution and mention its applications.

Z-Z-Z END