PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2017
(Sixth Semester)

Branch – **MATHEMATICS WITH COMPUTER APPLICATIONS**

CORE ELECTIVE – II
MATHEMATICAL STATISTICS

Time : Three Hours Maximum : 75 Marks

SECTION-A (20 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 2 = 20)

1 Define extended Axiom of addition.

2 Define pairwise independent events.

3 State continuous distribution function.

4 Define continuous random variable.

5 Define mathematical expectation.

6 Define continuous convex function.

7 Write the moments of Bernouli distribution.

8 Write the characteristic function of binomial distribution.

9 Write the moment generating function of t- distribution.

10 Define F- statistic.

SECTION - B (25 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a Probability of the impossible event in zero (i.e) $p(\phi) = 0$.

OR

b If A and B are any two events (sub sets of sample spaces) and are not disjoint, then $P(A \cup B) = P(A) + P(B) - P(A \cap B)$..

12 a The diameter of an electric cable say x is assumed to be a continious random variable p.d.f $F(x) = 6x(1-x); 0 \le x \le 1$.
(i) check that above is p.d.f.
(ii) Determine a number b such that $p(x<b) = p(x>b)$.

OR

b Explain concept of marginal distribution functions.

13 a If x and y are independent random variables then E(xy) = E(x) E(y).

OR

b Let x be a random variable the following probability distribution.

X :	-3	6	9
P(x = x):	1/6	1/2	1/3

Find E(x) and $E(x^2)$ and using law of expectation , evaluse $E(2x+1)^2$.

14 a Ten coins are thrown simultaneously . Find the probability of getting at least seven heads.

OR

b To find recurrence relation for the moments of Binomial Distribution.

Cont....

15 a Explain assumption for student's t-test and also t-test for single mean.

OR

b A certain stimulus administered to each of the 12 patients resulted in the following increase of blood pressure.
5,2,8,-1,3,0,-2,1,5,0,4, and 6 can be calculated that the stimulus in general be accompanied by an increase in blood pressure.

SECTION - C (30 Marks)

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

16 The axiom of continuity follows from the extended axiom of addition and vice versa.

17 For the following probability distribution $dF = y_0 e^{-|x|} dx$, $-\infty < x < \infty$ show that $y_0 = ½$, $\mu_1^1 = 0$, $6 = \sqrt{2}$ and mean deviation about mean 1.

18 In four tosses of a coin, let x be the number of heads. Tabulate the 16 possible outcomes with the corresponding values of x. By simple counting derive the distribution of x and lance calculate the expected value of x.

19 To find mean deviation about mean of binomial distribution.

20 A random sample of 10 boys had the following I.Q's 70,120,110,101,88,83,95,98,107,100. Do the data support the assumption of a population mean I.Q of 100? Find a reasonable range in which most of the mean.I.Q values of samples of 10 boys.

Z-Z-Z END