PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2018
(Fifth Semester)

Branch- **STATISTICS**

STATISTICAL INFERENCE - II

Time : Three Hours Maximum : 75 Marks

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

1 Define Composite hypothesis.

2 What is Power of the test?

3 Define Likelihood function.

4 Define UMPT.

5 What is the basic assumption in all the exact sample tests?

6 Write the formula for testing significance of equality of two means.

7 Define F distribution.

8 Define Chi square distribution.

9 What is dichotomy?

10 Flow is association of attributes measured?

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

1 1 a Explain Type I error and Type II errors.

OR

b Let p be the probability that a com will fall ahead In single toss in order to test H0:p=T/2 against Hl:p=3-4. The coin is tossed 5 times and HO is rejected, if more than 3 heads are obtained. Find the probability of type I error and power of the test.

12 a What are the properties of Likelihood Ratio test?

OR

h Examine whether a best critical region exists for testing the null hypothesis $H_0 : \theta = \theta_0$ against the alternative hypothesis $H, : \theta > O_o$ for the parameter 6 of the distribution:

$\blacksquare f(x, 6) = 1 + \#/(x + <9)^2, 1 < x <$ cc

13 a What are the assumptions of student t test?

OR

b The mean weekly sales of soap bars in departmental stores was 146.3 bars per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2. Was the advertising campaign successful?

14 a State and prove additive property of x^2 varieties.

OR

b Describe F test for testing the significance of an observed multiple correlation coefficient.

15 a Explain coefficient of colligation.

OR

b Investigate the association between darkness of eye-colour in fathers and son from the following data:

Fathers with dark eyes and sons with dark eyes	:50
Fathers with dark eyes and sons with not dark eyes	:79
Fathers with not dark eyes and sons with dark eyes	:89
Fathers with not dark eyes and sons with not dark eyes	: 782

SECTION - C 130 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 1 0 = 30)

16 State and prove Nevmann Pearson Fundamental Lemma.

17 Describe the LR procedure for testing the variance of a normal population.

18 A Coefficient of correlation of 0.2 is derived from a random sample of 625 pairs of observations.
(i) Is this value of r significant?
(ii) What are the 95% and 99% confidence limits to the correlation coefficient in the population?

19 In one sample o 8 observations, the sum of the squares of deviations of the sample values from the sample mean was 84.4 and in other sample of 10 observations it was 102.6. Test whether this difference is significant at 5 percent level, given that the 5 percent point of F for ni=7 and n_2=9 degrees of freedom is 3.29. -

20 Find if A and B are independent, positively associated or negatively associated, n each of the following cases:
(i) N = 1000,(A) = 470,(5) = 620,and(AB) = 320
(ii) (AB) = 256, $(aB) = 168, (A/3) = 48$ and (a/?) = 144.

Z-Z-Z END