## SECTION -C (30 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 (a). Derive that first four moments of Binomial distribution.

OR

(b). Obtain that recurrence relation for the moments of Poisson distribution.

12 (a). Obtain mean and variance of Hyper Geometric distribution.

OR

(b). Derive that moment generating function of Multinomial distribution.

13 (a). Derive that moment generating function of Normal distribution.

OR

(b). If X is uniformly distributed with mean 1 and variance 4/3, find $P(X < 0)$.

14 (a). Prove additive property of Gamma distribution.

OR

(b). Bring out constants of Beta distribution of second kind.

15 (a). Derive the Chi-Square distribution.

OR

(b). Elucidate the advantages and disadvantages of t- distributions.

Z-Z-Z END

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BSc DEGREE EXAMINATION DECEMBER 2022**
(Fifth Semester)

Branch – **STATISTICS**

**STATISTICAL INFERENCE - II**

Time: Three Hours Maximum: 75 Marks

**SECTION-A (10 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (10 x 1 = 10)

1 Neyman-Pearson Lemma provides the best critical region (BCR) for testing
(i) Simple Null Vs Simple Alternative
(ii) Simple Null Vs Composite Alternative
(iii) Composite Null Vs Simple Alternative
(iv) Composite Null Vs Simple Alternative

2 Identify the Composite Hypothesis in the following
(i) $H_0$:$\mu$=0, $\sigma^2$=0 (ii) $H_0$:$\mu \leq 0$, $\sigma^2$=0
(iii) $H_0$: $\sigma^2 = \sigma_0^2$, $\mu$– is known (iv) None of the above

3 When $X_1, X_2, \ldots X_n$ follows Poisson Distribution with parameter $\lambda$, then the value of T(X) when the likelihood function is decomposed
(i) $\sum X_i^2$ (ii) $\sum X_i$ (iii) $\bar{X}$ (iv) None of the above

4 UMPCR exists for
(i) one sided alternative (ii) two sided alternative
(iii) either (i) or (ii) (iv) None of the above

5 Significance of a Simple Correlation coefficient can be tested by:
(i) t-test (ii) Z-test
(iii) Chi-Square test (iv) F-test

6 The test statistic for testing the equality of two population means, when the population variances are known is
(i) $\frac{\bar{X}-\bar{Y}}{\frac{\sigma_X^2}{m}+\frac{\sigma_Y^2}{n}}$ (ii) $\frac{\bar{X}-\bar{Y}}{\frac{s_X^2}{m}+\frac{s_Y^2}{n}}$
(iii) $\frac{\bar{X}-\bar{Y}}{\sqrt{\frac{\sigma_X^2}{m}+\frac{\sigma_Y^2}{n}}}$ (iv) $\frac{\bar{X}-\bar{Y}}{\sqrt{\frac{s_X^2}{m}+\frac{s_Y^2}{n}}}$

7 The test statistic $F = S_1^2/S_2^2$ is used for testing
(i) H0 : $\mu 1 = \mu 2$ (ii) H0 : $\sigma_1^2 = \sigma_2^2$
(iii) H0 : $\sigma_1 = \sigma_2$ (iv) H0:$\sigma_1 = \sigma_{02}$

8 t - distribution ranges from
(i) $-\infty$ to 0 (ii) 0 to $\infty$ (iii) $-\infty$ to $\infty$ (iv) 0 to 1

9 Measures of association usually dealt with
(i) Attributes (ii) Quantitative factors
(iii) Variables (iv) Numbers

10 The frequency of class can always be expressed as a sum of frequencies of
(i) Lower order classes (ii) Higher order classes
(iii) Zero order classes (iv) None of the above

**Cont...**