PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Fourth Semester)

Branch – **INFORMATION TECHNOLOGY**

STATISTICS FOR INFORMATION TECHNOLOGY - II

Time: Three Hours Maximum: 75 Marks

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

Module No.	Question No.	Question	K Level	CO
1	1	The errors in a survey other than sampling errors are called a) formula error b) planning error c) non-sampling error d) none of the above	K1	CO1
	2	A function of variate for estimating a parameter is called a) an estimate b) an estimator c) a frame d) a statistic	K2	CO1
2	3	Test of hypothesis H_0: $\mu = 70$ vs. H_1: $\mu > 70$ leads to a) one sided left tailed test b) two sided right tailed test c) two sided test d) none of the above	K1	CO2
	4	A hypothesis may be classified as a) simple b) composite c) null d) all of the above	K2	CO2
3	5	Student's t – test was invented by a) R.A.Fisher b) G.W.Snedecor c) W.S. Gosset d) W.G.Cochran	K1	CO2
	6	The degrees of freedom for t – statistic for paired t test based on n pairs of observations is a) 2(n – 1) b) (n – 1) c) 2n – 1 d) $n_1 + n_2 - 2$	K2	CO2
4	7	The ratio of between sample variance and within sample variance follows a) F - distribution b) Z – distribution c) t – distribution d) chi – square distribution	K1	CO3
	8	Degrees of freedom for chi-square in case of contingency table of order (4X3) are a) 12 b) 9 c) 8 d) 6	K2	CO3
5	9	Kruskal-Wallis analysis of data is meant for a) one – way classification b) two - way classification c) non – classified data d) none of the above	K1	CO3
	10	What is the primary application of the sign test? a) To compare means of two independent groups b) To compare variances of two independent groups c) To determine if a sample median differs from a known value d) To test the equality of proportions in two independent groups	K2	CO3

SECTION - B (35 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the selection of simple random sampling with and without replacement.	K2	CO1
		(OR)		
	11.b.	Explain the sampling and non - sampling errors.		

Cont...

2	12.a.	Explain the general procedure of testing of hypothesis.	K3	CO2
		(OR)		
	12.b.	The means of two large samples of 1000 and 2000 items are 67.5 cms and 68 cms respectively. Can the samples be regarded as drawn from the population with standard deviation 2.5 cms? Test at 5% level of significance.		
3	13.a.	Two types of batteries are tested for their length of life and the following data are obtained: No. of samples: Type A = 9, Type B = 8; Mean Life (in hours): Type A = 600, Type B = 640; Variance: Type A = 121, Type B = 144 Is there a significant difference in the two means? ($t_{9+8-2=15\ df}$ @0.05 = 2.131)	K4	CO2
		(OR)		
	13.b.	Explain the testing procedure of paired t test.		
4	14.a.	Explain the testing procedure of Analysis of Variance (ANOVA).	K3	CO3
		(OR)		
	14.b.	Explain the concept and properties of chi – square distribution.		
5	15.a.	Test the following two samples came from the same population. Use sign test. A: 7, 8, 5, 2, 9, 5, 10, 12, 14, 16, 18, 20, 30, 15, 7, 8 B: 2, 7, 8, 10, 15, 20, 12, 8, 7, 10, 8, 10, 20, 10, 8, 9	K4	CO3
		(OR)		
	15.b.	Explain the testing procedure of Kruskal Wallis test.		

SECTION –C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain the methods of non - probability sampling with suitable examples.	K4	CO1
2	17	Explain the testing procedure of equality of two proportions for large sample test.	K4	CO2
3	18	Two random samples drawn from two normal populations are: X: 20, 16, 26, 27, 22, 23, 18, 24, 19, 25 Y: 27, 33, 42, 35, 32, 34, 38, 28, 41, 43, 30, 37 Obtain the estimates of the variance of the population and test 5% level of significance whether the two populations have the same variance. ($F_{(11,9)\ df}$ @ 5% = 3.10).	K4	CO2
4	19	The following table gives the number of good and bad parts produced by each of three shifts in a factory. Day: Good 900, Bad 130, Total 1030 Evening: Good 700, Bad 170, Total 870 Night: Good 400, Bad 200, Total 600 Total: Good 2000, Bad 500, Total 2500 Is there any association between the shift and the equality of parts produced? ($\chi^2_{0.05,\ 2\ df} = 5.991$).	K4	CO3
5	20	Explain the testing procedure of Run test.	K4	CO3

Z-Z-Z END