

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch - STATISTICS

HYPOTHESES TESTING

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	A hypothesis may be classified as (a) simple (b) composite (c) null (d) all the above	K1	CO1
	2	Level of significance is the probability of (a) type I error (b) type II error (c) not committing error (d) any of the above	K2	CO1
2	3	A test T which is at least as powerful as any other test of the same size is called (a) best test (b) most powerful test (c) uniformly most powerful test (d) none of the above	K1	CO2
	4	Neyman-Pearson lemma provides (a) an unbiased test (b) a most powerful test (c) an admissible test (d) Minimax test	K2	CO2
3	5	The ratio of the likelihood function under H_0 and under the entire parametric space is called (a) probability ratio (b) sequential probability ratio (c) likelihood ratio (d) none of the above	K1	CO3
	6	Student's t-test is applicable only when: (a) the variate values are independent (b) the variable is distributed normally (c) the sample is not large (d) all the above	K2	CO3
4	7	In sequential probability ratio test (SPRT), the sample size is (a) fixed (b) fixed but small (c) fixed but large (d) a random variable	K1	CO4
	8	In SPRT, decision about the hypothesis H is taken (a) after each successive observation (b) after a fixed number of observations (c) at least after five observation (d) when the experiment is over	K2	CO4
5	9	Kolmogorov-Smirnov test is a (a) one left-sided test (b) one-right-sided test (c) two-sided test (d) all the above	K1	CO5
	10	Non-parametric methods are based on (a) mild assumptions (b) stringent assumptions (c) no assumptions (d) none of the above	K2	CO5

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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.	What is meant by a statistical hypothesis? Explain the concept of type I and type II errors.	K3	CO1
		(OR)		
	11.b.	Explain the concept of most powerful test.		
2	12.a.	Difference between UMPUT and UMPST.	K4	CO2
		(OR)		
	12.b.	Show that UMP test is unbiased.		
3	13.a.	Construct the LR test for the mean of a normal population.	K4	CO3
		(OR)		
	13.b.	Show that the Binomial distribution possesses MLR property.		
4	14.a.	Describe Wald's sequential probability ratio test.	K5	CO4
		(OR)		
	14.b.	Derive their approximate expressions for the sequential probability ratio test.		
5	15.a.	What are the advantages and drawbacks of non-parametric method over parametric methods?	K4	CO5
		(OR)		
	15.b.	Explain the test procedure for Median 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 concept of most powerful test and discuss how the Neyman-Pearson lemma?	K4	CO4
2	17	Show that Every most powerful or uniformly most powerful critical region is necessarily unbiased.	K5	CO5
3	18	Explain the test for the equality of variances of two normal populations.	K5	CO5
4	19	Establish the relationship between SPRT and random walk.	K4	CO4
5	20	Explain in detail Kolmogorov – Smirnov two sample test.	K5	CO4

Z-Z-Z END