22STP312N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMBER 2025
(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	The idea of testing of hypothesis was first set forth by: (a) R.A Fisher (b) J. Neyman (c) E.L Lehman (d) A. Wald	K1	CO1
	2	In testing of hypothesis ,whether a test is one-sided or two-sided depends on: (a) alternative hypothesis (b) simple hypothesis (c) composite hypothesis (d) null hypothesis	K2	CO1
2	3	A Uniformly most powerful test among the class of unbiased test is termed as: (a) minimax test (b) minimax unbiased test (c) uniformly most powerful unbiased test (d) unbiased test	K1	CO2
	4	A critical region W satisfying $P_\theta(W) = \alpha$ for all $\theta \in \Theta_0$ is called (a) a uniformly most powerful region (b) a similar region (c) a complete region (d) a Neyman-Parson region	K2	CO2
3	5	The distribution of the likelihood ratio test statistic $-2\log\lambda$ under H_0 is: (a) Normal distribution (b) Exponential distribution (c) Chi-square distribution (d) t-distribution	K1	CO3
	6	The test for the equality of means of several normal populations assumes that the populations are: (a) heteroscedastic (b) homoscedastic (c) identical in all aspects (d) non-normal	K2	CO3
4	7	In SPRT the quantities A and B are determined using the probabilities of (a) type I and type II errors (b) confidence intervals (c) mean and variance (d) sufficient statistics	K1	CO4
	8	The operating characteristic function $L(\theta)$ gives the probability of (a) rejecting H_0 when it is true (b) accepting H_0 when the true parameter is θ (c) obtaining a large likelihood ratio (d) reaching the critical region too early	K2	CO4
5	9	Parameter of the population are known as _____ (a) statistical test (b) F test (c) non- parametric test (d) parameter test	K1	CO5
	10	Sign test variable have _____ distribution. (a) Normal (b) Continuous (c) Poisson (d) Binomial	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.	Discuss the randomized test.	K3	CO1
		(OR)		
	11.b.	What is the critical region in a hypothesis test, and how is it determined?		
2	12.a.	Write a note on UMP test.	K4	CO2
		(OR)		
	12.b.	When does every similar test have Neyman structure, and why is this useful?		
3	13.a.	Define Likelihood Ratio test. Under what circumstance would you recommend this test?	K4	CO3
		(OR)		
	13.b.	How can you apply likelihood ratio test in case of large samples?		
4	14.a.	Define the O.C. function of SPRT.	K4	CO4
		(OR)		
	14.b.	Explain how the sequential test procedure differs from the Neyman-Pearson test procedure.		
5	15.a.	What do you understand by non-parametric methods of testing of hypothesis.	K2	CO5
		(OR)		
	15.b.	Describe the procedure in 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 how the Neyman-Pearson lemma enables to obtain the most powerful critical region for testing a simple hypothesis against a simple alternative.	K3	CO1
2	17	Show that every most powerful or uniformly most powerful critical region is necessarily unbiased.	K4	CO2
3	18	Explain the general method of construction of likelihood ratio test and state its important properties.	K5	CO3
4	19	What is a sequential test of statistical hypothesis? Explain the strength of a simple null hypothesis versus a simple alternative hypothesis.	K5	CO4
5	20	How can one use the Kolmogorov-Smirnov test for two samples problems.	K3	CO5

Z-Z-Z END