

Instructions

1. There are TWO SECTIONS in this question paper.
2. All questions in Section – I carry equal marks.
3. Attempt ANY THREE questions from SECTION – I.
4. SECTION – II IS COMPULSORY and carries 8 marks.
5. Figures to the right indicate full marks of the questions/sub-questions.

Q.1	a)	Write a note on importance of Testing of hypothesis. Also, define Statistical hypothesis, Simple and Composite hypothesis, Types of error.	(07)
	b)	If $X \sim f(x) = \frac{1}{\theta}, 0 < x < \theta$ The hypothesis $H: \theta=3$ vs $K: \theta = 4$ is to be tested by means of single observation X. If the critical region is (a) $X > 0.4$, then, find probability of Type I and Type II errors. Also, find power of the test.	(07)
Q.2	a)	State and prove Neyman Pearson Lemma.	(07)
	b)	A random sample of size n is taken from $P_0(\theta)$. Use Neyman Pearson Lemma to find out most powerful critical region for testing $H_0: \theta = \theta_0$ Vs $H_1: \theta = \theta_1$, (Where $\theta_0 < \theta_1$).	(07)
Q.3	a)	Explain the test procedure to test the significance of Population Mean, based on a large sample.	(07)
	b)	Explain test procedure of testing significance of an observed correlation coefficient.	(07)
Q.4	a)	Derive test statistic for testing the null hypothesis. $H_0: P_1 = P_2$.	(07)
	b)	Given an observed correlation coefficients r based on paired sample of size n from bivariate normal population, discuss a test procedure of testing significance of observed correlation coefficient r.	(07)
Q.5	a)	Derive a test statistic for testing hypothesis independence of two attributes.	(07)
	b)	What is variance ratio test? Explain the test procedure for it in detail.	(07)

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Q.6	a)	Explain paired t test, in detail.	(07)
	b)	Explain test procedure of testing significance of difference between two means, stating necessary assumptions.	(07)
Q.7	a)	What are nonparametric tests? State differences between parametric and nonparametric tests.	(07)
	b)	Define: Run. In usual notations, explain Runs test.	(07)
Q.8	a)	Explain Mann Whitney test.	(07)
	b)	Ten women were randomly selected and their weight (in lbs.) before and after they were put on a new diet were recorded as under: Weight Before Diet: 180 178 165 200 160 145 170 210 185 155 Weight after Diet : 174 181 157 198 152 150 160 205 178 160 Use the sign test to test the claim that the new weight loss diet is effective. (Level of significance is 0.05)	(07)
SECTION – II			
Q.9	Answer following		08
	a)	Define Most powerful critical region.	
	b)	In context to testing of hypothesis, out of two types of errors, which one is more serious?	
	c)	What is power function?	
	d)	Give one example of composite hypothesis.	
	e)	What do you mean by large sample?	
	f)	A test statistic defined on a large sample, has a probability distribution, which is approximately normal. Do you agree?	
	g)	Which distribution is used in deriving a test statistic for testing significance of observed multiple correlation coefficient.	
	h)	State null hypothesis associated with paired sample sign test.	

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