

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – DATA SCIENCE

FOURTH SEMESTER – APRIL 2022

PDS 4603 – STATISTICAL INFERENCE

Date: 15-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART A

Answer ALL questions.

10 * 2 = 20

- 1) Differentiate between Null hypothesis and Alternative hypothesis.
- 2) What are the two types of errors in testing of hypothesis?
- 3) What do you mean by Level of Significance concept?
- 4) What are Most Powerful Tests?
- 5) Write the test procedure for testing two proportions in the case of large samples.
- 6) Write the test procedure for testing the significance of a regression coefficient.
- 7) How will you carry out Independence of Attributes test?
- 8) How will you use F-distribution to test the equality of two variances?
- 9) Which assumptions are associated with Non-Parametric tests?
- 10) Write the test procedure for Wald-Wolfowitz Run Test.

PART B

Answer ALL questions.

5* 8 = 40

11) a) Briefly explain: (i) Most Powerful Test (ii) Importance of NP Lemma

or

b) Suppose that we want to test $H_0: \theta = 0.5$ against $H_1: \theta = 1$ in the case of the distribution $f(x, \theta) = 6x(1-x)$, $0 \leq x \leq \theta$. Find the size and power of the test, assuming that the Critical Region is given as $x \leq 0.5$.

12) a) Use NP Lemma to obtain BCR for testing $H_0: \sigma = \sigma_0$ against $H_1: \sigma = \sigma_1$ in the case of the Normal distribution $N(0, \sigma^2)$.

or

b) Derive the LR test to test $H_0: \mu = \mu_0$ against $H_1: \mu \neq \mu_0$ in the Normal distribution $N(\mu, \sigma^2)$, where σ^2 is unknown.

13. (a) In a sample of 1000 people from Maharashtra, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this State?

or

(b) A sample of 100 insurance policy holders, average age is 28.8 years and standard deviation is 6.35 years. Can we say that the population mean age is 30.5 years?

14. (a) Ten individuals are chosen at random from a Normal population and their heights are found to be 63, 63, 67, 66, 68, 69, 70, 70, 71, 71 inches. Test whether the population mean height is 66 inches? [Table value is 2.62]

or

(b) In an immunization experiment, following results were obtained. Test whether the vaccine succeeds in controlling the disease [Table Value is 7.82].

Affected	Unaffected
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