



## PART - D

Answer any 2 questions. Each carries 6 marks.

(2x6=12)

22. Derive the most powerful critical region for testing  $H_0 : \mu = \mu_0$  against  $H_1 : \mu = \mu_1$ , where  $\mu_1 < \mu_0$  in  $N(\mu, \sigma)$  ( $\sigma$  known).
23. The blood sugar levels of 10 patients were found to be 230, 248, 245, 246, 235, 243, 260, 273, 262, 265 mg/dL. They were given a newly introduced drug for lowering the blood sugar level. The sugar levels after medication are 180, 195, 205, 201, 183, 196, 210, 215, 206, 208 mg/dL respectively. Test whether the drug is effective or not, at 5% level of significance, assuming that blood sugar levels are normally distributed.
24. The following table shows the results of a survey conducted to study about the awareness of people about chronic kidney disease. Test whether education and awareness are associated or not. (Take  $\alpha = 0.05$ )

Awareness \ Education	Excellent	Good	Average	Poor
Upto 10 <sup>th</sup> Std.	25	18	13	4
Graduate	28	22	19	6
Post Graduate	35	26	19	5

25. Explain Kruskal-Wallis test.



Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/Improvement) Examination, November 2023  
(2019 – 2021 Admissions)  
CORE COURSE IN STATISTICS  
5B05 STA : Statistical Inference – II

Time : 3 Hours

Max. Marks : 48

*Instruction : Use of calculators and statistical tables are permitted.*

## PART - A

Answer all questions. Each carries 1 mark.

(6x1=6)

1. Define P-value.
2. When do you say that a hypothesis is composite ?
3. The degrees of freedom for a 't' test for testing significance of sample correlation coefficient based on 15 observations of a bivariate data is
4. Name a test used for testing goodness of fit.
5. The lower line in the box of a vertical box plot represents
6. Name a test to check for normality of a data.

## PART - B

Answer any 7 questions. Each carries 2 marks.

(7x2=14)

7. What do you mean by likelihood ratio test ?
8. Define significance level.
9. What do you mean by uniformly most powerful test ? Give an example.

P.T.O.



10. Write down the test statistic for testing equality of proportions and its probability distribution.
11. How do you test the significance of a sample proportion ?
12. The frequency distribution of numbers shown when a die was thrown 120 times is as given below.

Number Shown	1	2	3	4	5	6
Frequency	24	14	26	20	16	20

Test whether the die is unbiased or not. (Take  $\alpha = 0.01$ )

13. State the application of 't' distribution in tests of statistical hypothesis.
14. Distinguish between parametric tests and non-parametric tests.
15. Explain signed rank test.

## PART - C

Answer any 4 questions. Each carries 4 marks.

(4x4=16)

16. A population has the probability density function  $f(x) = \frac{1}{\theta}, 0 < x < \theta$ . To test the null hypothesis  $\theta = 2$  against the alternative hypothesis  $\theta = 3$  based on a single observation  $X$ ,  $X \geq 1.8$  is used as the critical region. Find the size and power of the test.
17. State and prove Neymann-Pearson lemma.
18. Describe Student's 't' test for testing the equality of means of two normal populations.
19. There were 280 respondents in a survey conducted in a village. Among them, 130 were smokers. Test the hypothesis that 50% of the people in the village are smokers at 1% level of significance.
20. Explain 'F' test for equality of variances.
21. Describe sign test.