K20U 1553

Reg. No. : ....

Name : ....

V Semester B.Sc. Degree (CBCSS – Reg./Sup./Imp.)
Examination, November 2020
(2014 Admn. Onwards)
CORE COURSE IN STATISTICS
5B05STA : Statistical Inference – II

Time : 3 Hours

Max. Marks : 48

Instruction : Use of calculators and statistical tables are permitted

PART – A
(Short Answer)

Answer all the 6 questions.

$(6 \times 1 = 6)$

1. Distinguish between type I and type II errors.

2. What do you mean by size of a test ?

3. What do you mean by F-test ?

4. Write down the assumptions for Student's t-test.

5. What are the disadvantages of non-parametric tests ?

6. Define Median test.

PART – B
(Short Essay)

Answer any **7** questions.

$(7 \times 2 = 14)$

7. Define most powerful critical region.

8. Give examples for simple and composite hypotheses.

9. Distinguish between one-tailed and two-tailed tests.

10. State the standard error of the difference of two sample means for testing the equality of means of two populations, explaining the symbols used. (Assume that the population standard deviations are known)

11. Explain the exact test for normal mean when the variance is unknown and the alternative hypothesis is two sided.

12. A sample of 900 members is found to have a mean of 3.4 cm and standard deviation 2.61. Could it be reasonably regarded as a sample from a large population whose mean is 3.25 cm ? Use two tailed test and $\alpha = 0.01$.

13. State the null hypothesis of a goodness of fit test and how will you take decision whether to reject or accept the null hypothesis ?

14. What test statistic will you use to test $H_0 : \sigma = \sigma_0$ of normal population with known mean and write down its distribution ?

15. Explain the situation in which a sign test is used.

PART – C
(Essay)

Answer any 4 questions.

$(4\times4=16)$

16. Explain briefly the procedure followed in tests of statistical hypothesis.

17. Find the probability of type I error of the test which rejects H_0 if $X > 1 - \alpha$ in favour of H_1, if X has p.d.f. $f(x) = \theta x^{\theta - 1}$, $0 < x < 1$ with $H_0 : \theta = 1$ and $H_1 : \theta = 2$. Find the power of the test.

18. Explain the test procedure for testing equality of means of two normal populations with equal variances.

19. Explain the chi-square test of independence of two attributes.

20. Four coins are tossed 80 times. The distribution of number of heads is given below.

No. of heads	0	1	2	3	4	Total
Frequency	4	20	32	18	6	80

Test whether the coins are unbiased using chi-square test at 1% level of significance.

21. Explain one sample Kolmogorov Smirnov test.

PART – D
(Long Essay)

Answer any 2 questions.

$(2\times6=12)$

22. A population follows distribution with p.d.f. $f(x, \theta) = \theta x^{\theta - 1}$, $0 < x < 1$ and 0 elsewhere. To test $H_0 : \theta = 1$ against $H_1 : \theta = 2$ a random sample of size 2 (X_1, X_2) was used. The critical region was defined by the inequality $\frac{3}{4x_1} < x_2$. Find the significance level and power of the test.

23. Explain the test procedure for testing the significant difference between population proportion of success and the sample proportion of success.

24. Explain chi-square test for population variance. Test the hypothesis that $\sigma = 10$, given that s = 15 for a random sample of size 50 from a normal population.

25. Explain signed rank test.