

M.Sc.(Ag.) Examination, 2017
Semester-II
Agricultural Economics and Statistics
Course: STAT-553
(Nonparametric Techniques)

Time : 4 Hours

Full Marks : 80

Questions are of value as indicated in the margin.

Answer *any five* questions.

1. (a) What do you mean by nonparametric methods? What are the advantages and disadvantages of nonparametric methods?
 (b) Explain the concept of null and alternative hypotheses. 4+6+6=16
2. (a) How can one judge the relative performance of two tests?
 (b) Give some examples of location parameter. Explain one sample sign test in details. 5+3+8=16

3. (a) What indication can one get from the number of runs?
 (b) The following data were obtained on the genders of twenty five customers standing in a queue in front of a bank cash counter, recorded in accordance with the time of their arrival:

M M F M M M F F M M M F M M M F M M M F F F M M F

Perform a test at 5% level of significance to see whether the customers arrive in a random order with respect to their gender. 6+10=16

4. (a) What do you mean by analysis of variance (ANOVA)? Write the assumptions of ANOVA.
 (b) An experiment was conducted on 21 animals to determine the weight gain (in kg.) under different feed. The data are given below:

Feed 1: 3.50, 3.80, 3.57, 3.56, 3.81

Feed 2: 3.79, 4.10, 4.11, 3.95, 4.25, 4.40

Feed 3: 4.00, 4.50, 4.51, 4.75, 5.00

Feed 4: 3.59, 3.82, 4.09, 3.96, 3.82

Test at 5% level whether the 4 types of feed help in gaining some weight or not.

6+10=16

5. (a) A random sample of 10 diabetic patients is selected to see the effect of reducing blood sugar level of a new drug. Their fasting blood sugar levels (gm/ml.) are measured initially (before) and after using the drug for three months.

Fasting blood sugar level (gm/ml.)

Patient	1	2	3	4	5	6	7	8	9	10
Before (X_i)	125	132	137	128	140	160	155	145	132	152
After (Y_i)	110	135	125	132	140	142	148	127	132	140

Perform a test at 1% level to see if the new drug is effective in reducing blood sugar.

P.T.O.

(2)

- (b) How to resolve the problem of zero difference in sign test?
- (c) Discuss about the situations where Friedman's test can be used. 8+4+4=16
6. Discuss in detail about Wilcoxon matched-pairs signed-ranks test. 16
7. (a) What are the basic steps involved in any nonparametric test of hypothesis?
- (b) Write down the need of nonparametric statistical methods.
- (c) What assumptions are generally made for a nonparametric test? 6+5+5=16
8. Write short notes (*any two*)
- (a) Test for randomness
- (b) Scale of Measurements
- (c) Errors in testing of hypothesis and power of a test
- (d) Test for goodness of fit 2×8=16
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