

Ex/Math/Stat/22/10-Stat/2018

BACHELOR OF SCIENCE EXAMINATION, 2018

(2nd Year, 2nd Semester)

STATISTICS (Subsidiary)

Paper - 10 Stat

[Inference - II]

Full Marks : 50

Time : Two Hours

The figures in the margin indicate full marks.

(Symbols and Notations have their usual meanings)

Attempt Question No. 1 and any *three* from the rest.

1. What are the mean and variance of a Chi-Square random
varriable with 100 degrees of freedom ? 2

2. Write short notes on :

(i) Signed Rank Test

(ii) Run Test

(iii) Test for Independence

(iv) Test for Goodness of fit. 4+4+4+4

[*Turn over*]

[2]

3. (a) The following are measurements of breaking strength of a certain kind of 1-inch cotton ribbon in gram :

163 165 160 189 161 171 158 151 169 162
163 139 172 165 148 166 172 163 187 173

Use sign test to test whether the mean breaking strength is 160 gms or it is greater at both 5% and 1% level of significance.

- (b) The following are weight gains in pounds of two random samples of young lambs fed with two different diet but kept under identical conditions otherwise :

Diet I : 16.3, 10.1, 10.7, 13.5, 14.9, 11.8, 14.3,
10.2, 12.0, 14.7, 23.6, 15.1, 14.5, 18.4,
13.2, 14.0.

Diet II : 21.3, 23.8, 15.4, 19.6, 12.0, 13.9, 18.8,
19.2, 15.3, 20.1, 14.8, 18.9, 20.7, 21.1,
15.8, 16.2.

Use the U-test at 5% and 1% significance level to test the pair of hypotheses : $H_0 : \mu_1 = \mu_2$ vs. $H_1 : \mu_1 < \mu_2$.

4. State the necessary details and briefly write down the definition, model and the table for a one way ANOVA. (No proof is needed).

[Turn over]

[3]

5. (a) The following are octane rating of a certain kind of gasoline : 97.5, 95.2, 97.3, 96.0, 96.8, 100.3, 97.4, 95.3, 93.2, 99.1, 96.1, 97.6, 98.2, 98.5 and 94.9. Use signed rank test at 5% significance level and test whether the mean octane rating of this kind of gasoline is 98.5 or not.

- (b) M W M W M M M W M W M M M W W
M M M M W W M W M M M W M M M W W W
M W M M M W M W M M M M W W M
Above is an arrangement of M and W, lined up to purchase a concert ticket.

Test its randomness at 1% and at 5% level.
