

M.Sc. Part-II Semester-III (CBCS) Examination
STATISTICS
ADVANCED STATISTICAL INFERENCE
Paper-IX

Time : Three Hours]

[Maximum Marks : 80

N.B.:—Solve either (A) or (B) from each question.

1. (A) (a) Define randomized decision rule. Describe need of randomization while taking decision with the help of an example.
(b) Explain testing of hypothesis as decision theoretic problem.
(c) Explain different types of loss function used in decision theory. 6+6+4

OR

- (B) (i) Define :
(a) Loss function
(b) Risk function
(c) Equivalent decision rule.
(ii) Explain problem of point estimation as decision theoretic problem.
(iii) Explain three basic elements of decision theory. 6+6+4
2. (A) (a) Define :
(i) Bayes decision rule
(ii) Admissible decision rule
(iii) Minimax decision rule.
(b) Show that Bayes decision rule is admissible, if it is unique except for risk equivalence. 6+10

OR

- (B) (i) Define :
(a) Complete class of decision rule
(b) Essentially complete class of decision rule.
(c) Minimal essentially complete class of decision rule.

- (ii) Describe criteria of choosing estimator according to Bayes approach. Hence define Bayes estimator. Find Bayes estimator when loss function is squared error.

6+10

3. (A) (a) What is the difference between parametric and non parametric methods ? Also explain advantages of non parametric method.

- (b) Explain sign test with example. 8+8

OR

- (B) (i) Explain Wilcoxon paired sample sign rank test.

- (ii) Explain Kolmogorov-Smirnov one sample test. 8+8

4. (A) (a) Explain different types of alternative hypothesis used in non-parametric inference.

- (b) Explain median test for small sample. 8+8

OR

- (B) (i) Explain Wald-Wolfowitz run test.

- (ii) Discuss sign test for two samples. 8+8

5. (A) (a) Define U statistic for one and two sample. Also discuss its use.

- (b) What is linear rank statistic ? Establish its variance. 7+9

OR

- (B) (i) Describe linear rank statistic and in which condition it reduces to Mann-Whitney statistic ?

- (ii) Derive variance of u statistic. 7+9