

Mid-West University
Examinations Management Office
Surkhet, Nepal
End Semester Examinations -2078

Bachelor level/ B.Sc / 5th Semester

Time: 3 hrs

Subject : Statistical Inference-II (STAT 451)

Full Marks : 100

Pass Marks : 50

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks

GROUP-A

1. Attempt all the questions

[7x2=14]

- a. Define decision theory.
- b. What is posterior distribution?
- c. Write down the formula to construct payoff table?
- d. What is the salvage value?
- e. Write down the optimistic criterion.
- f. What is wald's sequential test?
- g. Define average sample number (ASN).

GROUP-B

2. Attempt all the questions

[10x3=30]

- i. What are the advantage and disadvantage of non parametric test?
- ii. Describe the kolmogorov- smirnov one sample test.
- iii. What is mannwhitney U test? Mention its application.
- iv. Explain OC function of of sequential probability ratio test (SPRT)?
- v. When should the non parametric test preferably?
- vi. What are the applications of chi-square distribution?
- vii. What are the basic steps for laplace criterion.
- viii. Write about the posterior distribution.
- ix. What do you mean by decision tree?
- x. Discuss about Hurwitz criterion of realism.

GROUP-C

Attempt any 'EIGHT' questions

[8x7=56]

3. Explain test procedure of mann-whitney U test for (i) small sample case (ii) large sample case.
4. Describe the two sample median test for small samples. How is the median test carryout for large samples?
5. The data of the percentage of broken groundnut pods recorded from an experiment are given below 9.8, 10.4, 11.5, 10.4, 8.5, 8.0, 10.5, 7.5, 8.8, 9.2
Test the hypothesis that the percentage of broken pods has the median 8. Use sign test.
6. If $X \sim B(1, p)$. Derive the sequential probability ratio test for testing
 $H_0: p = p_0$ against $H_1: p = p_1$ so that $0 < p < 1$. Also determines the OC function and ASN function of the sequential test.
7. A manager is faced with the problem of choosing one of the two products A and B for manufacturing. The profit (in lakh) of two types of product against different levels of market acceptability of the products is given in the following utility table:

Markets product	Good	Fair	poor
A	25	10	1
B	40	5	2

What will be the manager's decision if (i) maximax and (ii) maximin decision rule is applied?

8. If $X \sim N(\mu, 1)$ and the prior distribution μ is $N(0,1)$. Using the square error loss function $L(\mu, d) = [\mu - d(x)]^2$, find the bayes confidence interval for μ .
9. Discuss on the general procedure of Bayesian
10. Suppose x is a single observation drawn from poisson distribution $p(\lambda)$ and the prior distribution of λ is known to be Gamma distribution with parameters α and β . Using the quadratic loss function, find the Bayes estimator of λ .
11. Derive sequential probability ratio test for testing mean of normal distribution $N(\mu, \sigma^2)$ when variance σ^2 is known.

THE END