

Mid-West University
Examinations Management Office
 Semester End Examination 2080

Bachelor level/ B. Sc. /4th Semester
 Time: 3 hours
 Subject: Statistical Inference-I (STAT345/STA445)

Full Marks: 60
 Pass Marks:30

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

Long answer questions (attempt *all*). [4x6 = 24]

1. Prove that $E(p) = P$
2. If a random sample $X = x_1, x_2, x_3, x_4, \dots, x_n$ of size n is drawn from a $N(0, \sigma^2)$ population examine if MVB estimator of σ^2 exists, find MVB.
3. A random sample of 60 boys has a mean weight of 28 kgs and standard deviation of 3kgs. Test the hypothesis that the mean weight of all the boys is 32kgs. $Z_{0.05} = 1.96$
4. State and prove Neyman - Pearson Lemma.

OR

A sample of 500 bulbs of a company showed an average life of 1400 hours with standard deviation of 30 hours. Obtain 95% confidence limits for population mean. $Z_{0.05} = 1.96, Z_{0.01} = 2.576$

Group - B

Short answer questions (attempt *all*). [6x4 = 24]

5. Prove that $E(\bar{x}) = \mu$
6. Marks of 8 students before and after tuition is given below:

Before tuition	50	54	52	53	48	51	53	54
After tuition	54	57	54	55	52	56	56	55

Can you conclude that tuition has benefited the students? $t_{0.05, 7} = 1.895$

7. Write the conditions of sufficiency.
8. Write the difference between point estimator and interval estimation give one example.
9. Let x_1, x_2, \dots, x_n be a random sample of size n from $N(\mu, \sigma^2)$. Then find MLE of μ when σ^2 is known.
10. If t is an unbiased estimator of θ than show that t^2 is a biased estimator of θ^2 .

OR

Write the properties of good estimator.

Group - C

Very short answer questions (attempt *all*). [6x2 = 12]

11. Define estimation.
12. What is meant by consistent estimator?
13. Define hypothesis testing.
14. Define alternative hypothesis.
15. Define type II error
16. Define standard error.

The End