Mid-West University

Examinations Management Office

Final Examinations -2081

Level: Bachelor level/Science/ Semester: IV — F. M: 60

Time: 3hrs. — P. M: 30

Subject: Statistical Inference-I (STA345/445)

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 Question (Attempt ALL) **[4x6 =24]**

1. Prove that E(p)= P
2. If a random sample $X= x_1, x_2, x_3, x_4 \dots\dots\dots, x_n$ 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 Question (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 down the difference between point estimation and interval estimation with an example.
9. Let $x_1, x_2 \dots\dots x_n$ 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 Question (Attempt ALL) **[6x2 =12]**

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

THE END