SCST1223/SECI 1143: PROBABILITY & STATISTICAL DATA ANALYSIS
2024/2025 – SEMESTER 2

QUIZ 2

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Date	:	5/7/2025			

Marks: ____ / 20

QUESTION 1 **[10 MARKS]**

As part of a digital learning initiative, a university conducted a survey to estimate the proportion of students who prefer recorded lectures over live classes. A random sample of 880 students was selected, and 506 indicated they preferred recorded lectures for flexibility and revision purposes. This case study aims to estimate the proportion of the entire student population who prefer recorded lectures.

(Do all calculations to 3 decimal points.)

a) Calculate a point estimate of the true proportion of students who prefer recorded lectures.

(2 marks)

b) Construct and interpret a 99% confidence interval for the true proportion.

(8 marks)

QUESTION 2 **[10 MARKS]**

A nutritionist claims that the average daily water intake for adults is 2.5 liters. A public health agency wants to investigate whether this average differs among office workers in a major city. A random sample of 36 office workers was taken, and the following statistics were obtained:

- Sample mean intake: 2.7 liters
- Population standard deviation: 0.6 liters

Assume water intake is normally distributed, and use a 5% significance level.

a) State the null and alternative hypotheses.

(1 mark)

b) Calculate the value for test statistic.

(5 marks)

c) Find the critical region's value.

(2 marks)

d) Test the claim and state the conclusion.

(2 marks)

Asvini A/P Chandrasagaran No. Date

Quiz 2.

Question 1

a) Point Estimate.

$$\hat{p} = \frac{506}{880} = 0.575$$

b)

$$SE = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$SE = \sqrt{\frac{0.575 \times (1-0.575)}{880}}$$

$$= \sqrt{\frac{0.575 \times 0.425}{880}}$$

$$= \sqrt{0.000277}$$

$$= 0.017$$

$$20.005 = 2.576.$$

$$ME = 2 \times SE = 2.576 \times 0.017 = 0.044.$$

$$\hat{p} \pm ME$$

$$0.575 \pm 0.044$$

$$= (0.531, 0.619).$$

Interpretation:

We are 99% confident that the true proportion of students who prefer recorded lectures lies between 0.531 and 0.619.

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$$z_{0.005} = 2.576.$$

$$ME = 2 \times SE = 2.576 \times 0.017 = 0.044.$$

$$\hat{p} \pm ME$$

$$0.575 \pm 0.044$$

$$= (0.531, 0.619).$$

Interpretation:

We are 99% confident that the true proportion of students who prefer recorded lectures lies between 0.531 and 0.619.