



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.  
Tel: +254(0) 799 529 958, +254(0) 799 529 959, +254 (0)712 524 293  
Website: [www.must.ac.ke](http://www.must.ac.ke) Email: [info@mucst.ac.ke](mailto:info@mucst.ac.ke)

---

## UNIVERSITY EXAMINATIONS 2023/2024

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN ECONOMICS

### BEC 3252: ECONOMIC STATISTICS II

DATE: APRIL 2024

TIME: 2 HOURS

---

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

---

#### QUESTION ONE (30 MARKS)

- Explain any four methods of non-probability sampling citing examples. (8 Marks)
- In hypothesis testing there are four outcomes discuss, illustrating your understanding on Type I and type II errors. (6 Marks)
- A random sample of 12 items is taken and is found to have a mean weight of 60 kg and a standard deviation of 10kg. what is the mean weight of the population with a 95% confidence? (5 Marks)
- The profit function (in sh.'000') for a given company is given as:  
$$\text{Profit} = 10x - x^2 - 5$$
Where  $x$  represents time in months. Find the cumulative profit in the break-even time interval. (5 Marks)
- A manufacturing company is testing a plant for acceptance for the plant is to be accepted the mean reflectometer reading should be 19.5 and above.



A random sample of 35 readings is taken and found to have a mean of 19.7 with a standard deviation of 1.5

Required:

Test at 98% level of significance whether the company should accept the new plant.

(6 Marks)

### QUESTION TWO (20 MARKS)

- a) Enumerate any four assumptions of the normal distributions. (4 Marks)
- b) A cigarette manufacturer wishes to use a random sample to estimate the average nicotine content. The sampling error should not be more than one milligram above or below the true mean with a 95% confidence coefficient. The population standard deviation is 4 milligrams. What sample size should the company use in order to satisfy these requirement? (5 Marks)
- c) A sample of 600 Accounts was taken test the accuracy of posting and balancing of accounts where in 45 mistakes were found. Find out the population proportion. (5 Marks)
- d) Discuss the criteria for a good estimator According to R.A fisher. (6 Marks)

### QUESTION THREE (20 MARKS)

- a) Discuss the following terms as used in significance testing;
- i. Null and Alternative hypothesis (3 Marks)
  - ii. Sampling and composite hypothesis (3 Marks)
  - iii. Acceptance and Rejection Zone (3 Marks)
- b) You are working as a sales manager in Kombe enterprises. The following information has been supplied to you by two manufactures of Kombo products.

Company:	A	B
Mean life (in hours)	1300	1248
Standard deviation (in hours)	82	93
Sample size	100	110



Which brand of Kombo products are you to purchase if you desire to take a risk of 5%.

(11 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss the assumptions for 't' test. (5 Marks)
- b) A random sample of 15 items is taken and is found to have a mean weight of 50 grams and a standard deviation of 10 grams. What is the mean weight of the population with 99% confidence. (5 Marks)
- c) Prices of shares of a company on the different days in a month were found to be: 66 65 69 70 69 71 70 63 64 68 in shillings. Discuss whether the mean prices of shares in the month is 65. (10 Marks)

**QUESTION FIVE (20 MARKS)**

- a) What are some of the properties of the  $\chi^2$  test? Discuss any four. (4 Marks)
- b) Enumerate the application of the  $\chi^2$  test. (4 Marks)
- c) What are the required steps to perform the  $\chi^2$  test of hypothesis. (4 Marks)
- d) Perform a  $\chi^2$  test from the following information on Age groups and type of TV programme preferred.

Age group	A	B	C
Under 20	130	30	50
20 – 34	10	75	15
35 and over	10	30	60