EX0012

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT: ECONOMICS

PROGRAMME: BACHELOR OF SCIENCE HONOURS DEGREE IN ECONOMICS

COURSE CODE EC108 (2): STATISTICS FOR ECONOMISTS II

DURATION: 3 HOURS TOTAL MARKS: 100

INSTRUCTIONS TO CANDIDATES

1. **Answer ALL questions**
2. **The paper carries four questions**
3. **All questions carry equal marks of 25 each**
4. **No cell-phones allowed in the examination room**

QUESTION 1

Suppose that shopping times for customers at a local mall are normally distributed with known population standard deviation of 20 minutes. A random sample of 64 shoppers in the local grocery store had a mean time of 75 minutes.

a. Find the 90% confidence interval for the population mean. **[12 marks]**

b. Find the 95% confidence interval for the population mean. **[13 marks]**

QUESTION 2

The production manager of Tregers has asked you to evaluate a proposed new procedure for producing its standard door frames. The present process has a mean production of 80 units per hour with a population standard deviation of 8. The manager does not want to change to a new procedure unless there is strong evidence that the mean production level is higher with the new process. Advise him by testing the hypothesis using a sample size of 81 at the 5% and 10% level of statistical significance. **[25 marks]**

QUESTION 3

a. From historical data, such as sales records, Schweppes knows that 30% of its customers prefer Mazoe Orange crush, 50% prefer Raspberry, 15% prefer Cream Soda, and the remainder prefer Blackberry. Suppose that marketing analysts sample 200 people and find that 50 prefer Orange crush, 93 prefer Raspberry, 45 prefer Cream Soda, and the remainder prefers Blackberry. Test whether current preferences for these products changed from the known preferences.

[12 marks]

b. Seke Technologies, an electronics retail company in Bindura, has recorded the number of flat-screen TVs sold each week and the number of advertisements placed weekly for a period of 12 weeks as presented in the table below. Calculate the linear regression equation for predicting future TV sales.

Advertisements	4	4	3	2	5	2	4	3	5	5	3	4
Sales	26	28	24	18	35	24	36	25	31	37	30	32

[13 marks]

QUESTION 4

a. The data in the table below shows the usage of a basket of three toiletry items in two-person households in Bindura for 2020 and 2021 respectively. The data was collected from household surveys. Use 2020 as the base period and find the Paasche weighted aggregate composite price index for this basket of toiletries for 2021.

	Year 2020		**Year 2021**	
Toiletry items	**Unit price**	**Quantity**	**Unit Price**	**Quantity**
Soap	1.95	37	2.10	40
Deodorant	14.65	24	15.95	18
Toothpaste	6.29	14	6.74	16

[12 marks]

b. A financial analyst studied the annual returns of three different categories of unit trust. She wanted to know whether the average annual returns per category varied across unit trust

categories. A random sample of unit trusts from each of three categories (labelled A, B and C) were selected and their annual returns were recorded as shown in the table below.

A	B	C
11	7	14
9	10	13
6	8	11
12	13	16
14		10
11		

Test whether the financial analyst can conclude that the average annual returns from the three categories of unit trusts are the same at the 5% significance level. **[13 marks]**

END OF PAPER

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF MARKETING

PROGRAMME: BACHELOR OF BUSINESS STUDIES HONOURS IN MARKETING

RESEARCH METHODOLOGY **BS209**

DURATION: 3 HOURS

INSTRUCTIONS

1. Answer **Question One and ANY Three** questions.
2. Each question carries 25 marks.
3. Start answering each main question on a fresh page.
4. Credit will be given for appropriate use of illustrative examples.
5. No cell phones and programmable calculators are allowed in the examination room.
6. The use of non-programmable calculators and statistical formulae list is allowed

QUESTION 1 (Compulsory)

The coach of Manchester City Football Club is interested in finding out whether the weather has an effect on his team's performance. Of the 135 matches played, the following are the results

	Outcome	Weather	
		Good	Bad
Results	Win	75	15
	Draw	10	10
	Lose	15	10

Using the Chi-square test at 5% significance level:

a. Formulate a suitable null and alternative hypothesis(5)

b. Carry out a test to determine whether the weather has an effect on the performance of Manchester City Football Club (15)

c. Comment on your findings(5)

[25 Marks]

QUESTION 2

i. Contrast the 4 probability sampling methods used in research (10)

ii. The following are sampled coursework marks scored by an Accounting student in his 10 semester modules.

34, 25, 15, 40, 45, 30, 36, 39, 48, 48

From the above marks calculate the following:

Mean (2)

Median (2)

Mode (1)

Variance (5)

Standard deviation (2)

Interpret the meaning of the variance (3)

[25 Marks]

QUESTION 3

Ten architects each produced a design for a new building and two judges, A and B, independently awarded marks, x and y respectively, as given in the table below.

Design	Judge A (x)	Judge B (y)
1	50	46
2	35	26
3	55	48
4	60	44
5	85	62
6	25	28
7	65	30
8	90	60
9	45	34
10	40	42

Required:

i. Formulate the null and alternative hypothesis that there is no correlation between the marks awarded by the two judges (5)

ii. Calculate Spearman's rank correlation coefficient for the data at 2 decimal places (15)

iii. Interpret your findings at 5% significance level (5)

[25 Marks]

QUESTION 4

A machine fills cans with soft drinks so that their contents have a nominal volume of 330 ml. Over a period of time, it has been established that the volume of liquid in the cans follows a normal distribution with mean 335 ml and standard deviation 3 ml. A setting on the machine is altered, following which the operator suspects that the mean volume of liquid discharged by the machine into the cans has increased. He takes a random sample of 60 cans and finds that the mean volume of liquid in these cans is 340 ml. Does this confirm his suspicion?

Required:

i. Formulate the null and alternative hypothesis (5)

ii. Identify the 5 key statistics in this problem (5)

iii. Define the critical region by drawing a well labelled diagram (5)

iv. Carry out the relevant test at 5% significance level (5)

v. Interpret your findings (5)

[25 Marks]

QUESTION 5

a. Using relevant examples, identify and discuss the four measurement scales used in business research (15)

b. Evaluate the role of ethics in business research (10).

[25 Marks]

QUESTION 6

Prepare a research proposal with the following sub titles

i. Problem statement (5)

ii. Research objectives (5)

iii. Research questions (5)

iv. Research design (5)

v. Data collection instruments (5)

[25 Marks]

END OF PAPER