



PAN AFRICA CHRISTIAN UNIVERSITY

BACHELORS OF COMMERCE

END OF TERM EXAMINATION

DEPARTMENT: BUSINESS STATISTICS II

COURSE CODE: BCM 204

COURSE TITLE: BUSINESS MATHEMATICS (ROYSAMBU EVENING)

EXAM DATE:

TIME:

INSTRUCTIONS

- Read all questions carefully before attempting.
- Question **One** is **compulsory** i.e Section **A** is **compulsory**
- Answer any **THREE** Questions in Section **B**
- Write your **student number** on the answer booklet provided.

SECTION A: COMPULSORY

QUESTION ONE

The data below shows the age of machines and weekly maintenance cost of the machines .

Age (X)	15	20	25	30	35	40	30	50	50	60
Cost (Y)	190	240	250	300	310	335	300	380	350	375

Required

- a) Determine the regression equation (8 Marks)
- b) Determine the maintenance cost for a machine of this type that is 80 months old (2 Marks)

SECTION B: ANSWER ANY THREE QUESTIONS

QUESTION TWO

- a) The probability that a student will pass a mathematics class is $\frac{2}{3}$ and the probability that he will fail and English exam is $\frac{5}{9}$. The probability that he will pass at least one exam is $\frac{4}{5}$.

Required

The probability that the student will pass both Maths and English exam (3 Marks)

- b) The mean weight of 500 packaging tins from a production process is normally distributed with a mean weight of 151 grams and a standard deviation of 15 grams.

Required

- i. The number of packaging tins that weigh between 120 grams and 155 grams (4 Marks)
- ii. The number of packaging tins that weigh more than 185 grams (3 Marks)

QUESTION THREE

- a) In relation to hypothesis testing and estimation distinguish between null hypothesis testing and alternative hypothesis (4 Marks)
- b) Beta Ltd. deals with the manufacture of a detergent known as “safi”. A recent survey undertaken to determine the percentage of residents who use “safi” revealed that out of 500 residents selected at random only 10% use “safi”. In order to increase the usage of “safi”, amongst the residence, the company undertook an advertising campaign that cost Shs. 2.5 Million. A survey undertaken after the campaign revealed that out of 600 residences selected at random 15% use “safi”.

Required

Determine whether the advertising campaign increased the usage of “safi” among the residence (use a significance level of 5%) (6 Marks)

QUESTION FOUR

- a) A manufacturing company is testing a plant for acceptance. For a plant to be accepted the mean reflector reading should be 19.5 and above.

A random sample of 25 readings is taken and found to have a mean of 19.7 and a standard deviation of 1.5.

Required

Test at 95% level of confidence whether the company should accept the new plant. (3 Marks)

- b) Research findings on computers suggest that the life span of personal computers fit a normal distribution with a mean of 4.2 years and a standard deviation of 0.8 years.

Required

- i. Determine the proportion of personal computers that will have a life span less than 4 years (3 Marks)
- ii. Determine the proportion of personal computers that will have a life span of between 3.4 years and 5.8 years. (4 Marks)

QUESTION FIVE

- a) Chemaluk Employment Bureau has shortlisted 7 Males and 4 Females applicants for the interview.

There are only 3 job positions available for employment.

Required

- i. The probability that the three employees are of the same gender (4 Marks)
 - ii. The probability that the three employees will be two females and one male (3 Marks)
- b) The possibilities that three salesmen; A, B, and C, meeting the target set 0.3, 0.5 and 0.7 respectively. Determine the probability that at least one of the salesmen will met their target. (3 Marks)

QUESTION SIX

a) The table below shows marks scored by 8 students in a mathematics and English test

Students	1	2	3	4	5	6	7	8
Marks scored in Mathematics	31	36	44	28	56	78	36	96
Marks scored in English	36	46	66	46	36	26	46	76

Required

The rank co-efficient of correlation. Interpret the results

(5 Marks)

b) Ten entries in painting competition were ranked by two judges as shown below:

Entry	A	B	C	D	E	F	G	H	I	J
Judge 1	5	2	3	4	1	6	8	7	10	9
Judge 2	4	5	2	1	6	7	10	9	3	8
Judge 3	3	4	1	2	5	6	9	10	2	7

Required

Determine the rank coefficient of correlation.

(5 Marks)