



**ALUPE UNIVERSITY
COLLEGE**

...Bastion of Knowledge...

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OFFICE OF THE DEPUTY PRINCIPAL

ACADEMICS, RESEARCH AND STUDENTS' AFFAIRS

UNIVERSITY EXAMINATIONS 2019 /2020 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER REGULAR EXAMINATION

FOR THE BACHELOR IN BUSINESS MANAGEMENT

COURSE CODE: BBM 350

COURSE TITLE: MANAGERIAL STATISTICS

DATE:04/12/2019

TIME: 8.00-12.00pm

INSTRUCTION TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 4 PRINTED PAGES

PLEASE TURN OVER

REGULAR-MAIN EXAM
BBM 350: MANAGERIAL STATISTICS

STREAM BBM

DURATION 3 HRS

INSTRUCTIONS:-

- Answer **Question ONE** and any other **TWO**
- **QUESTION ONE** carries 30 Marks.

QUESTION ONE ✓

- a) Discuss the importance of the concepts of probability in business (6 marks)
- b) Elucidate the assumptions of chi square (6 marks)
- c) A binomial distribution has $n=20$ and $p=0.3$. Find the mean and variance of this distribution (5 marks)
- d) Find the probability that at most 5 defective bolts will be found in a box of 200 bolts if it is known that 2% of such bolts are expected to be defective. Take $e^{-0.4}=0.0183$ (5 marks)
 $= e^{-4}$
- e) The same fuel was tested on 21 similar cars under identical conditions. The fuel consumption was found to have a mean of 41.6 mpg with standard deviation of 3.2 mpg. Only 14 of the cars were found to completely satisfy current exhaust emission guidelines.
 - i) Calculate a 95% CI for fuel consumption for this type of car (4 marks)
 - ii) Calculate a 99% CI for the percentage of similar cars that completely satisfy current exhaust emission guidelines (4 marks)

QUESTION TWO

The specification for the length of an engine is a minimum of 99mm and a maximum of 104.4mm. A batch of parts is produced that is normally distributed with mean of 102mm and a standard deviation of 2mm. Parts cost Kshs 10 to make. Those that are too short have to be scrapped; Those too long are shortened at a further cost of Kshs 8

required

- a) Find the percentage of parts which are i) undersized ii) oversized (10 mks) (4 marks)
- b) Find the expected cost of producing 1000 usable parts (5 marks)
- c) Calculate And explain the implications of changing the production method so that the mean is halfway between the upper and lower specifications limit. (5 marks)
(the standard deviation remains the same)

QUESTION THREE ✓

- i) The time taken to complete jobs of a particular type is known to be normally distributed with mean 6.4hrs and standard deviation 1.2 hrs. What is the probability that a randomly selected job of this type takes
 - a) Less than 7hrs (3 marks)

- b) Less than 6hrs (3 marks)
 c) Between 6hrs and 7hrs (4 marks)
 ii) Discuss the merits and demerits of probabilistic sampling design (10 marks)

QUESTION FOUR ✓

- i) Customers arrive randomly at a department store at an average rate of 3.4 per minute. Assuming the customers arrival forms a poisson distribution, calculate the probability that
- a) No customers arrive in any particular minute (3 marks)
 b) Exactly one customer arrives in any particular minute(3 marks)
 c) Two or more customers arrive in any particular minute. (4 marks)
- ii) Discuss the limitations of tests of significance (7 marks)

QUESTION FIVE

- i) From past records the probability that a machine will need correcting adjustments during a days production run is 0.2. If there are 6 of these machines running on a particular day, find the probability that
- a) No machine needs correcting (3 marks)
 b) Just one machine needs correcting (3 marks)
 c) Exactly two machines needs correcting (3 marks)
 d) More than two machines needs correcting (5 marks)
- ii) Clearly highlight the assumptions in analysis of variance (7 marks)

Prob designs

- Simple random
- Stratified
- Systematic

disadv

Merits

- Less costly
- Time effective
- Suitable for small samples
- Accurate results
- well rep of the sample
- Not prone to biasness

Demerits

- unsuitable for large samples
- Expensive
- Tedious
- Time consuming
- Computation may be complex esp w/ large samples

Limitations of test of origin

- results cannot be expressed with certainty
- cannot be applied in a mechanical fashion
- requires special techniques