



UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD

Business Education Certificate Examinations

INTRODUCTION TO PROBABILITY AND STATISTICS I

CPS 112

YEAR I, SEMESTER I

2½ HOURS

MONDAY, 3RD DECEMBER 2018

INSTRUCTIONS TO CANDIDATES

1. This paper consists of **two** sections **A** and **B**.
2. Section **A** is compulsory and carries **20** marks.
3. Section **B** consists of **six** questions. Answer only **four** questions from this section.
4. All questions carry equal marks.
5. All answers to each question should begin on a fresh page.
6. Do not write anywhere on this question paper.
7. All answers and rough work should be written in the official answer booklet provided.
8. Read other instructions on the answer booklet.

SECTION A – (20 MARKS)

Answer all questions in this section

Question One

- (a) Distinguish between a **population** and a **sample**. (04 marks)
- (b) Define the term **statistics**. (02 marks)
- (c) Nankulu sold the following trays of eggs in the first week of October: 20, 15, 18, 13, 25, 16 and 12.
 - (i) Calculate the average number of trays sold. (03 marks)
 - (ii) Determine the median sales. (02 marks)
- (d) Evaluate;
 - (i) 5P_3 . (02 marks)
 - (ii) 5C_3 . (02 marks)
 - (iii) From your results in 1(d)(i) and 1(d)(ii), would you conclude that ${}^5P_3 = {}^5C_3$? (01 mark)
- (e) Give **two** characteristics of a normal distribution. (02 marks)
- (f) Explain how you can use scatter plots to compare two variables. (02 marks)

SECTION B - (80 MARKS)

Answer only four questions from this section.

Question Two

- (a) Explain how you can use a stratified random sample to select a representative sample. (08 marks)
- (b) Write down **three** limitations of stratified random sampling as a sample selection method. (06 marks)
- (c) Explain how you would reduce the limitations in 2(b). (06 marks)

Question Three

The number of faults identified by a technician in a computer laboratory is given in **Table 1**

1. Use the data to answer question three and four.

04	07	13	05	06	13	15	06	10	06
11	18	12	18	15	12	07	07	11	17
09	16	12	14	16	14	08	04	12	18

Table 1

- (a) Calculate the;
- (i) Mean. (08 marks)
 - (ii) Mode. (05 marks)
 - (iii) Median using 5 classes. (05 marks)
- (b) Interpret your answers in 3(a)(i), 3(a)(ii) and 3(a)(iii). (02 marks)

Question Four

Using the same class interval and results in **question three**, compute the;

- (a) Variance (12 marks)
- (b) Standard deviation (04 marks)
- (c) Coefficient of variance (04 marks)

Question Five

- (a) Describe how you would use a questionnaire to collect data on the number of computer break downs in a school laboratory. (10 marks)
- (b) Outline **five** advantages of using questionnaire method to collect data. (10 marks)

Question Six

A technician realized that the probability of finding a broken computer in a laboratory is as shown in **table 2**.

Fault	0	1	2	3	4
Probability	0.10	0.15	0.30	0.30	0.15

Table. 2

- (a) Use the table to calculate the;

- (i) Expected number of broken computers. (05 marks)
- (ii) Variance and standard deviation. (11 marks)
- (b) Write down **two** characteristics of discrete probability function. (04 marks)

Question Seven

- (a) State **four** properties of probability. (08 marks)
- (b) Three machines defined as A, B and C produce the same item outputs as 40%, 35% and 25% respectively. A has a 5% defective rate, B has a 10% defective rate and C has 12% defective rate.
 - (i) Draw a probability tree for the information provided. (09 marks)
 - (ii) If an item is randomly selected from the total output, find the probability that it is defective. (03 marks)

END

Test	0	1	2	3	4
Probability	0.10	0.15	0.30	0.30	0.15

Table 2