BUSINESS MATHEMATICS 3
7073

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

ADVANCED LEVEL

JUNE 2018

Subject Title	Business Mathematics
Paper No.	3
Subject Code No.	7073

Three Hours

INSTRUCTIONS TO CANDIDATES

Answer **any FIVE** questions of your choice.

You are reminded of the necessity for good English and orderly presentation in your answers.

Show all steps in your calculations, giving the answer at each stage.

Use calculators, statistical formulae and financial tables where appropriate.

You will be provided with graph paper(s) where necessary.

1. You are provided with the following information concerning the evaluation of price and quantity of some commodities in the city of Bafoussam in 2012 and 2013.

Commodities	2012		2013	
	Unit Price (00 FCFA)	Quantities In Kg	Unit Price (000 FCFA)	Quantities In Kg
Rice	1,200	150	1,250	140
Milk	180	250	180	220
Groundnuts	250	350	260	280

Taking 2012 as the reference year, calculate:

(a) the price and quantity indices of each commodity. **(7 marks)**

(b) simple price and quantity aggregates. **(7 marks)**

(c) Laspeyres and Paasche price and quantity indices. **(6 marks)**

(Total = 20 marks)

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2. A statistics instructor has observed that the number of typographical errors in new editions of textbooks vary considerably from book to book. After some analysis, he concludes that the number of errors is a poisson distribution with a mean 1.5 per 100 pages. The instructor randomly selects 100 pages of a new book.

(a) What is the probability that there are no typographical errors? **(6 marks)**

Suppose that the instructor has just received a copy of a new statistics book and noticed that there are 400 pages:

(b) What is the probability that there are no typographical errors? **(6 marks)**

(c) What is the probability that there are five or fewer typographical errors? **(8 marks)**

(Total = 20 marks)

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3. Mr. PENN has been employed as a mathematics teacher in a secondary school. The principal made him to realize that there have always been a large difference in the performance of the students in the past years. The young and new teacher decided to observe it for himself, so he gave a test on 40 and below are the marks of 45 students in upper sixth.

Marks	0	5	10	15	20	25	30	35	40
No of students	3	7	6	4	7	5	6	5	2

(a) Establish the increasing cumulative frequency table. **(3 marks)**

(b) Present the Ogive curve. **(7 marks)**

(c) Estimate the median from the Ogive curve. **(2 marks)**

(d) Calculate the variance and standard deviation. **(8 marks)**

(Total = 20 marks)

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4. Budgeting is becoming increasingly important in our present business world. Managers strife to know or predict future outcomes of economic transactions so that they can be precise in decision-making. Attempting to analyse the relationship between advertising and sales, the owner of a furniture store recorded the monthly advertising budget (000FCFA) and the sales (000FCFA) for a sample of 12 months. The data is listed below.

Advertising (x)	23	46	60	54	28	33	25	31	36	88	90	99
Sales(y)	9,600	11,300	12,800	9,800	8,900	12,500	12,000	11,400	12,600	13,700	14,400	15,

(a) Draw a scattered diagram. **(4 marks**

(b) Calculate the least square line Y on X. **(10 marks**

(c) What will be the sales value if advertisement expenses are 64,500 francs? **(6 marks**

(Total = 20 marks

5. The table below shows the number of goals scored home and away by seven teams in the football league in the Littoral Region.

Home (x)	25	20	12	15	14	24	20
Away (y)	10	14	12	13	6	10	8

Calculate:

(a) the spearman's rank coefficient of correlation for the data and interpret. **(12 marks)**

(b) the pearson is product-moment correlation coefficient for the data. **(8 marks)**

(Total = 20 marks)

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6. The selection of candidates for a certain progressional course is by means of an aptitude test. It is known that the scores of the potential candidates on the test follow a normal distribution with mean 42 and variance 49 marks.

(a) Find the probability that a candidate selected at random will score between 40 and 60 marks. **(8 marks)**

(b) Determine the percentage of recruits who score more than 35 marks. **(4 marks)**

(c) Given that 100 candidates took the test and that the pass mark is 50, calculate the probability that less than 10 candidates passed the test. **(8 marks)**

(Total = 20 marks

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7. (i) A mutual fund salesperson has arranged to call three people tomorrow. Based on past experience, the salesperson knows there is 20% chance of making a sale on each call. Knowing that the event is represented by "X" , that is P(X = x) is the probability of making sales;

(a) present the probability tree for the three calls. **(4 marks)**

(b) calculate the probability of making one sale. **(2 marks)**

(c) calculate the probability of making three sales. **(2 marks)**

(d) calculate the probability of making at least two sales. **(2 marks)**

(ii) Mr. Ambe is a tomatoes farmer in Foumban. He contacted Mr. Kum from Bamenda who plants a certain type of tomato seeds that germinates 90% of the time planted. If Mr. Ambe collects and plants 25 tomato seeds for Mr. Kum,

(a) what is the probability that exactly 20 seeds germinate? **(3 marks)**

(b) what is the probability that 24 or more seeds germinate? **(4 marks)**

(c) what is the probability that 24 or few seeds germinate? **(3 marks)**

(Total = 20 marks)

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8. In recent years, several companies have been formed to compete with ORANGE in long distance calls. All advertise that their rates are lower than ORANGE and as a result their bills will be lower. ORANGE has responded by arguing that there will be no difference in billing for the average consumer. A Statistics practitioner working for ORANGE determines that the mean and standard deviation of monthly long distance bills for all its residential customers are 17.09FCFA and 3.87 FCFA respectively. He then takes a random sample of 100 customers and recalculates their last month's bills using the rates quoted by a leading competitor. $\sum xi = 1{,}754.99$

(a) Calculate the sample mean. **(5 marks)**

(b) State the null hypothesis (H_0). **(2.5 marks)**

(c) State the alternative hypothesis (H_0). **(2.5 marks)**

(d) Assuming that the standard deviation of this population is the same as for ORANGE. Calculate the value of the "test statistic" (Z). **(6 marks)**

(e) Can we conclude that there is a difference between the average ORANGE bill and that of the leading competitors at a 5% significance level? **(4 marks)**

(Total = 20 marks)