Business Mathematics 3
7020

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examinations

JUNE XXXX **ADVANCED LEVEL**

Specialty Name (Specialty Code)	
Subject Title	**Business Mathematics**
Paper No.	**3**
Subject Code No.	**7020**

Three hours

INSTRUCTIONS TO CANDIDATES

Answer any FIVE questions.

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

In your calculations you are advised to show all steps in the working, giving the answer at each stage.

You are allowed to us calculators, statistical formulae and financial tables where appropriate.

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

You are advised to read carefully through the question paper, before you begin your answers.

1. The following table provide marks on a competitive examination for ten students in two courses:

Candidate	A	B	C	D	E	F	G	H	I	J
Accounting (X)	95	83	74	92	84	89	36	71	49	71
Business Maths (Y)	78	92	72	84	81	93	63	63	66	73

Calculate:

a) The equations of the least squares regression line of Y on X and X on Y **(8 marks)**

b) The product-moment correlation coefficient **(5 marks)**

c) The spearman's coefficient of correlation **(7 marks)**

(Total = 20 Marks)

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2. The table provides information for three commodities in the Muea Market in 2018 and 2019:

Commodities	2018		2019	
	Price (FCFA)	Quantity (KG)	Price (FCFA)	Quantity (KG)
Rice	600	500		
Groundnut	400	300		
Beans	500	400		

The prices of each commodity sold in 2018 increased by 10% in 2019, meanwhile their respective quantities dropped by 5%.

Using 2018 as based year, calculate:

a) The simple price and quantity indices for each product. **(6 marks)**

b) The simple price and quantity aggregates **(6 marks)**

c) The Laspeyres and Paasche indices **(8 marks)**

(Total = 20 marks)

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3. a) (i) What is skewness? **(2 marks)**

(ii) Differentiate between positively and negatively skewed distributions **(4 marks)**

b) A die is tossed 116 times and the following distribution is obtained:

Number on die (x_i)	1	2	3	4	5	6
Frequency (n_i)	14	22	30	25	15	10

Calculate:

i) The mean and the mean deviation of the distribution. **(6 marks)**

ii) The median and standard deviation of the distribution. **(5 marks)**

iii) The coefficient of skewness **(3 marks)**

(Total = 20 marks)

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4. (a) The probability that a regularly scheduled flight departs on time is 0.83, the probability that it arrives on time is 0.82, and the probability that it departs and arrives on time is 0.78.

Find the probability that a plane:

i) Arrives on time given that it departed on time **(3 marks)**

ii) Departed on time given that it arrived on time **(3 marks)**

iii) Arrives on time, given that it did not depart on time **(4 marks)**

(b) The marks X in a test are normally distributed with mean 40 and standard deviation 10. Find to 4 decimal places, the probability that a randomly chosen candidate scored:

i) Less than 65 marks. **(3 marks)**

ii) More than 60 marks **(3 marks)**

iii) Between 24 and 40 marks **(4 marks)**

(Total = 25 marks)

5. (a) A random variable X has probability distribution function given by:

X	2	5
P(X = x)	0.4	k

Calculate:

i) The value of k **(2 marks)**

ii) The mean **(2 marks)**

iii) The variance and standard deviation **(6 marks)**

(b) The daily output in KG of an industry that works a five day week is given below:

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	187	203	208	207	217
Week 2	207	208	210	206	212
Week 3	202	210	212	205	214
Week 4	208	215	217	217	213

Establish a five-period moving total and average for the output **(10 marks)**

(Total = 20 marks)

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6. The following table provides the information required for a project network:

Activity	**Immediate Pending Activity**	**Immediate Following Activity**	**Duration of Activity (Day)**
A	C	D,H	3
B	E	F	7
C	E	A	12
D	A	F	5
E	G	B,C	8
F	B,D,H	None	4
G	None	E	2
H	A	F	9

Required:

i) Draw the network diagram **(8 marks)**

ii) Identify the critical path and state the number of days it will take the project to be completed. **(4 marks)**

b) From the information given about each of the following sets of data, determine the missing values in the table:

	N	ΣX	ΣX^2	Mean	Standard deviation
a	----------	152.6	-----	10.9	1.7
b	52	-------	57,300	33	---------

(8 marks)

(Total = 20 marks)

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7. (a) Clearly define the following:

i) Type I Error **(2 marks)**

ii) Two tailed test **(2 marks)**

iii) Level of significance **(2 marks)**

iv) Critical regions **(2 marks)**

(b) A local retailer claims that among the four most popular beverages, customers have these preference rates; 62% for Ovaltine, 18% for Nescafe, 12% for Matinal and 8% for Bournvita. A random sample of 400 customers produced the following results:

Beverages	Ovaltine	Nescaafe	Matinal	Bournvita
Number of customers	240	80	36	44

At a 5% level of significance, test the claim that the percentages given by the local retailer are true. **(12 marks)**

(Total = 20 marks)

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8. (a) The probability that a certain football team wins a match is 0.7. given that the team plays 4 matches, find the probability that the team wins:

i) Exactly two matches **(3 marks)**

ii) At least one match **(3 marks)**

iii) More than half of the number of matches played **(4 marks)**

(b) The number of children delivered per week at a certain district hospital follows a poisson distribution with mean 2. Find correct to three decimal places, the probability that:

i) Exactly three children will be delivered per week. **(3 marks)**

ii) At least two children will be delivered in a particular week. **(3 marks)**

iii) At least three children will be delivered in a particular period of two weeks **(4 marks)**

(Total = 20 marks)
