MAIN EXAM

Quantitative techniques supplementary exam

UNIVEWRSITY DIPLOMA

CODE:DIB1111

2013 academic Account 1st year

TIME: 2Hours

Instructions

Answer question1 in section 1 and two questions in section II. Marks allocated to each question are shown at the end of the question show all your workings.

SECTION I

QUESTION ONE:-

2) Two machines. A and B are used to process certain items. The cost function for each machine is given by:-

Machine A: Y = 1513X Machine B: Y= 18-X+X2 where Y is the cost of producing X Items (Sh. '000').

X is the number of items produced per hours in hundreds.

Required.

If the maximum speed at which each machine can run is 400 items per hour, then.

i) Using a graph (No. calculations) determine the range of production for which each (6 marks)

ii) Determine which machine should be used if five hundred items are produced. (2 marks)

b) XYZ company Ltd invests in a particular project and it has been estimated that after months of running, the cumulative profit (Sh. 'ooo') from the project is given by the function 10x – x2-5, where x represents time in months. The project can run for eleven months at the most.

Required.

i) Determine the initial cost of the project (2Marks)

ii) Calculate the break-even fir in months for the project (4marks)

iii) Determine the best time to end the project (4Marks)

iv) Determine the total project within the break-even points (6marks)

(Total: 30 Marks)

SECTION II

Question two

a) The index of industrial production in the European Country by July 2001 is given below:-

Sector	**Weight**	**July 2001 index** (1994 = 100)
Mining and quarrying	41	361
Manufacturing		
Food drink and Tobacco	77	106
Chemicals	66	109
Metal	47	72
Engineering	298	86
Textiles	67	70
Other manufacturing	142	91
Construction	182	84
Gas, electricity and water	80	115

i) Calculate the index of industrial production for all industries and manufacturing industries. (6Marks)

ii) Comment on four results (4Marks)

b) Explain some of the result of index numbers (5Marks)

c) What are some of the commutations of index numbers (5Marks) (Total 20 Marks)

QUESTION THREE

a) The table below shows the income per month of borrowers and the percentage of all mortgages of provided by building society mortgages in the year 2000.

Income per month of borrowers		Percentage of all mortgages
Order 30,000		5
30,000	34,999	2
35,000	35,999	3
40,000	44,999	5
45,000	49,999	10
50,000	59,999	15
60,000	69,999	18

70,000	99,999	21
100,000	149,999	17
150,000 and over		4

Required

i) Calculate some soluble measures of central tendency and dispersion and comment on your results (9 Marks)

ii) Explain with an example the value of descriptive statistics in the accounting function. (3 marks)

b) State briefly whether the following pairs of events are independent, and why.

i) Being in accountant and having large feet (2 Marks)

ii) Earning a large salary and paying a large amount of income tax (2Marks)

iii) Being drunk while driving and having an accident. (2 marks)

Total: 20 Marks)

Question four:

3) The past records of salama industries indicate that about 4 out of 10 of the company's orders are for export. Further, their records indicate that 48 percent of all orders are for export in one particular financial quarters they expect to satisfy about 80 orders in the next financial quarters.

Required:-

i) Determine the probability that they will break their previous export records (7 Marks)

ii) Explain why you have used the approach you have chosen to solve part (i) above. (2Marks)

iii) Gear tyre company has just developed a new steel belted readical type that will be sold through a national chain of account stores. Because the tyre is a new product, the company's management believes that the mileage gurantee offered with the tyre will be an important factor in the consumer acceptive of the product. Before faciliting the tyre mileage is = 36,500 with metres and the standard and the standard deviation is = 5,000 kilometres. In addition, the data calculated indicate that a normal distribution is a reasonable assumption.

iv) Required

i) Gear tyre will distribute the tyres if 20 per and of the tyres manufactured can be expected to last more than 40,000 Kilometres. Should the company distribute the tyres? (4Marks)

ii) Explain briefly some of the advantages of the standard normal distribution.

(3 Marks.

(Total: 20 Marks

Question five

Moving averages are often used in an effort to identity movements in share

Approximate monthly closing prices (in.sh per share) for boys children ltd for December 2000 through November 2001 are shown below:-

Month		**Price (sh.)**
December	2000	10
January	2001	35
February	2001	39
March	2001	41
April	2001	36
May	2001	41
June	2001	34
July	2001	37
August	2001	35
September	2001	37
October	2001	41

Required:-

a) Use a 3-Month average to forecast the closing price for December 2001 (5Marks)
b) Use a3-month weighted moving average to forecast the closing price for December 2001. Use weight of 0.4 per most recent, period, 0.4 for this second period back and 0.2 for the third period back (5 Marks).
c) Use experiential smoothing with a smoothing constant of x = 0.35 to forecast the close price for December 2001 (3Marks)

d) Which method do you profer? Why? (Marks)

Total: 20 Marks)

SUPPLIMENTARY EXAM

Diploma Course Code: DIB 1111

1st year UNIVERSITY DIPLOMA

2013

Quantitative Techniques town compus

Time allowed is(2 Hours).

Instruction

Question 1 is compulsory and answer any two questions in section II show all your workings

SECTION I

QUESTION ONE:-

a) Two CPA students were discussing the relationship between average cost and total cost. One student said that since average cost is obtained by dividing the cost function by the number of units. Q, it follows that the derivative of the average cost is the same as marginal cost, since, the derivative of Q is 1.

Required:

Comment on this analysis. (4 Marks)

b) Gatheru and Kibirucertified public accountants have recently started to give business advice tot heir clients. Adding as consultants, they have estimated the demand give of the firm to be, AR: 200-8Q.

Where AR is average revenue in millions of shillings and Q is the output in units.

Investigations of the client firms cost profit showed that (mc) Margin cost is given by MC=Q2-28Q+211 (Millions of shillings).

Further investigations have shown that the firm's cost when not producing output is sh. 10 million.

Required.

i) The equation of total cost (10 Marks)

ii) The equation of total revenue (2 Marks)

iii) An expression for profit (2 Marks)

iv) The level of output that maximizes profit (10 Marks)

v) The equation of marginal revenue (2 Marks)

(Total: 30 Marks)

SECTION II

QUESTION TWO:-

2) Define the following terms as used in Markovian analysis:-

i) Transition Matrix (2 Marks)

ii) Initial probability vector (1 Mark)

iii) Equilibrium (1 Mark)

iv) Absorbing state (2 Marks)

c) A company employs classes of machine operators (A,B,C, and D): all new employers are hired as class D. and, through the system of production, may much up to a higher class. Currently, there are 200 classes D, 150 Class c, 90 class B and 60 class A employees. The company has signed an agreement with the sp specifying that 20 percentage of all employees in each class be proposed, one class in each year. Statistics show that each year 25 percent of the class D employees are separated from the company by reasons such as retirement, resignation and death, similarly is percent of class C, 10 percent of class B and 5 percent of class A employees are also separated for each employee lost, the company tyres new class D employee.

Required:-

i) The Transition matrix (7 Marks)

ii) The number of employees in each class two years after agreement with the union.(7 marks) (Total 20 Marks)

d) **QUESTION THREE** (20 Marks)

a) State clearly what is meant by two events being statistically independent? (2 Marks)

b) In a certain factory which employs 500, 20% of all employee have a minor accident in a given year. Of these 30% had safety instructions whereas 80% of all employees had no safety instructions.

Required:

Find the probability of anre-employed being accident – free given that he had:

i) No safety instructions (5 Marks)

ii) Safety Instructions (5 Marks)

i) An electric utility company has found that the weekly number of Queerness of lighting sticking the transformers is a poison distribution with mean 0.4.

ii) The probability that no transformer will be strut in a week (5 Marks)

(Total 20 Marks)

QUESTION FOUR:- **(20 Marks)**

Explain what is meant by the following terms as used in statistical inference

i) Statistical hypothensis (2 Marks

ii) Test of hypothensis (2 Marks)

iii) Type if error, (2 Marks)

iv) Type II error, (2 Marks)

v) Level of significance (2 Marks)

c) Cross lines group (CLG) has two factories in different parts of the country. This resources, including the labour force skills are regarded as identical and both factories were built at the same time.

A random sample of output data during a given period has been taken from each factory and concerted to standard hours of output per employees. The data re given below:-

Factory 1.42 50 43 39 41 49 52 41 46 48

Factory 2. 39 45 36 42 52 37 43 41 40 39

You are given that for factor 3 main: 45.1 and variance = 20.10 and that for factory 2 mean = 41.4 and variance = 21.16.

Required

i) Test the hypothensis that the mean standard hours four employees in the two factories is the same (7 Marks)

ii) Comment briefly on the conditions of the test and interpret the outcome. (3 Marks)

(Total: 20 Marks)

The following regression equation was calculated for a class of 24 CPA I student
Y = 3.1 + 0.021x, +0.0752 + 0.043x3
Standard error (0.019) (0.034) (0.018)
Where Y = students score on a theory examination

Xi= students rank (From the bottom) in high school
X2 = Student verbal aptitude score
X3 = a measure of student character
Plot the regression equation and test the hypothesis (20 Marks)