MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS ENTREPRENEURSHIP AND MANAGEMENT SCIENCES

SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ACCOUTANCY

DACC 105: BUSINESS STATISTICS

Date: 4/8/2016 **Time: 8.30-10.30 AM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE

a) A company has tendered for two independent contracts A and B. the probability of winning contract A is $\frac{2}{3}$ and that of winning contract B is$\frac{3}{5}$. Determine the probability of winning

i. no contract

ii. at least one contract

iii. contract A or B

iv. contract A and B

b) A retailer stocks two type of goods X and Y. Twelve units of X and five units of Y costs Sh.1,260, while nine units of X and fifteen units of Y costs Sh.1,620. John bought ten units of Y. Determine the amount he paid for them. (6 marks)

c) The total revenue function of a firm is given by:

$TR = 10Q^2 - 200Q$ Where Q = Quantity of goods sold.

Determine the level of output (Q) that will be sold for the firm in order to maximize total revenue. (4 marks)

d) The following table shows a probability distribution of customers received by a firm for a certain number of business days.

Number of Customers (X)	**Probability $P(X = x_i)$**
20	0.30
25	0.20
35	0.30
40	0.10
45	0.10
Total	**1.00**

i. Determine the expected number of customers in any business day.

ii. Calculate the variance in number of customers received by the firm. (6 marks)

e) A local TV is considering replacing one of its prime time dramas with a new family oriented comedy. To assist reach the final decision, a sample of size, $n = 400$ prime time viewers were interviewed after the review of the family comedy, 250 viewers indicated that they would watch it.

Determine the point estimate of the population proportion of the viewers who would watch the show.

Develop a 99% confidence interval for the proportion of viewers who will watch the new show. (6 marks)

QUESTION TWO

a) The marginal revenue and average cost functions are given by:

$MR = 200 + 10q \text{and} AC = 100 + 6q$

Where q =quantity of output.

Determine the:

i. profit function

ii. level of output that will maximize profit

iii. maximum profit (8 marks)

b) The following is a frequency distribution of the annual salaries of employees in a certain firm in a perfectly competitive industry.

Salary (Sh.000's)	**Number of Employees**
80 – under 100	5
100 – under 120	12
120 – under 140	15
140 – under 160	10
160 – under 180	2
180 – under 200	1

Calculate the:

i. Mean

ii. Median

iii. Standard deviation (12 marks)

QUESTION THREE

a) A company intends to introduce one of the three products X, Y or Z into the market. An analysis of the probable level of demand identified as: High, Medium and Low Demands was found to be 0.3, 0.5 and 0.2 for High, Medium and Low demands respectively. The payoffs associated with the products in the three levels of demand are given below.

Product	**Payoffs on Conditional Events (Profits in Sh.000's)**		
	High Demand	**Medium Demand**	**Low Demand**
X	200	120	−50
Y	300	200	−30
Z	250	150	0

i. Draw a decision tree including all the relevant information.

ii. Using expected value criteria, analyze the decision tree and recommend the best option to the company. (20 marks)

QUESTION FOUR

a) The following information was extracted from the books of a certain company showing the expenses that were incurred in running the production plant for the last ten years.

Age of Plant (Years)	**Running Expenses (Sh. 000's)**
1	5
2	4
3	10
4	12
5	15
6	15
7	20
8	12
9	25
10	30

Determine and interpret the Pearson's Product Moment Co-efficient of Correlation.

(10 marks)

b) The profits of a company for a period of eight years is given in the table below.

Year	**Profits (Sh.000's)**
2000	80
2001	100
2002	90
2003	125
2004	140
2005	120
2006	130
2007	150

Determine the trend line equation using the method of Least Squares and predict the profit for the year 2010.

QUESTION FIVE

a) A bank wishing to determine the average amount of time a customer must wait to be served. A random sample of n=100 customers and was found that, the mean waiting time was, s=7.2 minutes. Assuming the population standard deviation,$\sigma = 15$.Determine the 90% confidence interval estimate of the mean waiting time for all the customers.

(8 marks)

b) The following table gives the total production (in millions) of a company for the periods from the year 2006 to 2008.

Year	**Quarter**			
	1	2	3	4
2006	14	17	24	26
2007	17	20	27	30
2008	18	22	29	32

Calculate:

i. The four-quarter moving averages

ii. The centered moving averages