



MACHAKOS UNIVERSITY

University Examinations for 2017/2018 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS, ENTREPRENEURSHIP & MANAGEMENT SCIENCE

FIRST YEAR FIRST SEMESTER EXAMINATION FOR DIPLOMA

INPROCUREMENT AND SUPPLY CHAIN MANAGEMENT

DPS106: QUANTITATIVE TECHNIQUES

DATE: 4/12/2017

TIME: 11.00-1.00 PM

INSTRUCTIONS:

Answer Question One And Any Other Two Questions

QUESTION ONE COMPULSORY (30 MARKS)

- a) Briefly explain the relevance of quantitative techniques in business organizations (5marks)
- b) Discuss Four methods of collecting primary data stating one advantage and one disadvantage of each (8 marks)
- c) The following data represents the ages of 132 representatives who took part in a survey

Age (yrs)	20-24	25-29	30-34	35-39	40-44	45-49
No.of representatives	2	14	29	45	33	9

Required

- i) The range (2 marks)
- ii) The mean value of the ages (4 marks)
- iii) The median value of the ages (4 marks)
- iv) The mode value of the ages (4 marks)
- v) Differentiate between mutually exclusive events and an independent event. (4 marks)

QUESTION TWO (20 MARKS)

- a) The following information represents the number of sales and number of sales men in XYZ Limited in 2013

No.of sales(000) shs	0-4	5-9	10-14	15-19	20-24	25-29
No.of sales men	1	14	23	21	15	6

Required

- i) The standard deviation of the sales (5 marks)
- ii) the coefficient of variation (5 marks)
- iii) The pearsons measure of skewness (5 marks)
- iv)The mean deviation (5 marks)

QUESTION THREE (20 MARKS)

- a) Discuss three applications of probability in business (6 marks)
- b) A bag contains 80 balls of which 20 are red, 25 are blue and 35 are white. A ball is picked at random what is the probability that the ball picked is:
- i)Red ball (3 marks)
 - ii)Black ball (3 marks)
 - iii)Red or blue ball (4 marks)
- c) Discuss four merits of using mean as a measure of central tendency (4 marks)

QUESTION FOUR (20 MARKS)

- a) Find $\frac{dy}{dx}$ for

i. $y = \frac{x}{3+x^2}$ (3 marks)

ii. $y = \frac{x}{3x+7}$ (3 marks)

iii. $y = (x^2 + 16x + 5)^2$ (3 marks)

- b) Determine the critical value for the following functions and find out the critical value that constitutes a maximum

$$y = x^3 - 12x^2 + 36x + 8 \quad (3 \text{ marks})$$

c) i) Solve the following

$$i. 8y - 3x = 12$$

$$5y - 2x = 7 \quad (3 \text{ marks})$$

$$ii) 3 - x - x^2 = 0 \quad (3 \text{ marks})$$

d) Solve the following sets of inequalities

$$i) 3x - 4 \leq 8 + x < 2 + 7x \quad (2 \text{ marks})$$

$$ii) \frac{2x-7}{x-5} \leq 3$$

QUESTION FIVE (20 MARKS)

Your company manufactures large scale units. It has been shown that the marginal (or variable) cost, which is the gradient of the total cost curve, is $(92 - 2x)$ Shs. thousands, where x is the number of units of output per annum. The fixed costs are Shs. 800,000 per annum. It has also been shown that the marginal revenue which is the gradient of the total revenue is $(112 - 2x)$ Shs. thousands.

Required

i) Establish by integration the equation of the total cost curve (2 marks)

ii) Establish by integration the equation of the total revenue curve (2 marks)

iii) Establish the break even situation for your company (4 marks)

iv) Determine the number of units of output that would
 Maximize the total revenue,
 Maximize the total costs, together with the maximum total revenue and total costs
(4 marks)

b) Explain the meaning of the following types of sampling

i) Simple random sampling (2 marks)

ii) Stratified sampling (2 marks)

iii) Multistage sampling (2 marks)

v) Systematic sampling (2 marks)