KENYA METHODIST UNIVERSITY
End of Trimester 1, 2008 Examination

Faculty	:	**Science and Social Studies**
Department	:	**Computer and Information Systems**
Course Code	:	**MATH 130**
Course Title	:	**Basic Statistics**
Mode	:	**School-Based**
Time	:	**2 hours**

Instructions:
- Answer Question One and any other THREE questions from section B
- Show all your workings

SECTION A: Answer ALL questions in this section

Question One (30 marks):
a. Consider a normal distribution with mean 24.5 and a variance of 1.44. Determine the following:
   - (i.) P(x<=25)   (2 marks)
   - (ii.) P(20<= x <= 23)   (3 marks)

b. The probability of a student passing the exam is 0.52. Given that this represents a Bernoulli trial, and a school has 20 students, determine:
   - (i.) The probability that a student fails the exam   (2 marks)
   - (ii.) The probability that the first student picked passes and the second student fails (3 marks)
   - (iii.) The mean and standard deviation for the distribution   (5 marks)

c. Given that A and B are independent events, and that p(A) = 0.55 and p(B) = 0.62. Determine:
   - (i.) P(A and B)   (2 marks)
   - (ii.) P(A or B)   (2 marks)

d. Two random variables x and y have the following values: x(-1, 0, -2, 3, 1, 2) and y(4, 5, 3, 8, 6, 7). Determine the correlation coefficient of x and y   (6 marks)

e. The following marks were obtained from a class after the mid-term quiz:
   37, 60, 71, 42, 55, 57, 70, 81, 40, 45, 58, 66, 61, 66, 70, 60, 45, 55, 67, 66
   - (i.) What is the sample size?   (1 mark)
   - (ii.) Construct a frequency distribution table indicating the relative and percentage frequencies for the data   (4 marks)

SECTION B: Answer ANY THREE questions in this section:

Question Two (10 marks):
A survey of milk production by cows owned by members of a given society indicated that:
- 15 cows produce 10 litres of milk per day
- 20 cows produce 5 litres of milk per day
- 15 cows produce 7 litres of milk per day
- 18 cows produce 11 litres of milk per day
- 12 cows produce 8 litres of milk per day.

You are required to:
- (i.) Construct a grouped frequency distribution table. In your answer, indicate the class size and number of classes. Your table should include all the necessary columns. (5 marks)
- (ii.) Compute the arithmetic mean, mode and median for the data. (5 marks)

Question Three (10 marks):
The following data represents the comparison made between the price of a consumer product and the corresponding demand.

Price	32	33	35	40	47	46	44	38	50	58
Demand	68	58	58	50	48	48	48	42	36	32

You are required to:
- (i.) Compute the correlation coefficient for the distribution. (4 marks)
- (ii.) Determine the regression equation and draw the scatter diagram showing the regression line. (6 marks)

Question Four (10 marks):
The data below represents the percentage score of 25 students in a mid-term quiz. Given that the data has a normal distribution;

39, 41, 47, 58, 65, 37, 37, 49, 56, 59, 62, 36, 48, 52, 64, 29, 44, 47, 49, 52, 53, 54, 72, 50, 50
- (i.) Compute the mean and standard deviation for the score. (5 marks)
- (ii.) What is the probability that a student's score lies in the interval between 60 and 65? (5 marks)

Question Five (10 marks):
A school has 100 (60 girls and 40 boys) students, 10 teachers, and 4 subordinate staff members.
- (i.) A student is spotted at random. What is the probability that the student is a boy? (2 marks)
- (ii.) What is the probability that the three persons to arrive first in the morning are all students? (2 marks)
- (iii.) Given that there are 120 boys and 80 girls, and the top student is a girl, what is the probability that the second best student is also a girl? (2 marks)
- (iv.) What is the probability that bottom student is a boy? (2 marks)
- (v.) Given that all students are already in school, the watchman doesn't report during the day, and two teachers are already at school, what is the probability that the next person is the teacher on duty? (3 marks)