



EDO UNIVERSITY, IYAMHO, EDO STATE
FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS/ICT
FIRST SEMESTER EXAMINATION 2016/2017 SESSION

Course Title: **STATISTICS**

Course Code: **MTH 215**

Time allowed: **3 Hours**

Instruction: Answer any five (5) questions

Date: 5th May, 2017

- 1(a)i. Define the line of regression of y on x .
ii. Define the line of regression of x on y .
(b) Given $y = a + bx$ as the line of regression of y on x , for $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ observations. Derive the constant a and b .

- 2(a) What is Time Series.
(b) What are the components of a Time Series.
(c) The equation for yearly sales (in thousand Naira) for a commodity with 1st July, 2010 as origin is $Y = 81.6 + 28.8X$
(i) Determine the trend equation to give monthly trend values with 15th January as origin, and
(ii) Calculate the trend values for March 2011 to August 2011.

3. From the data given below, find:
(a) The two regression coefficients
(b) The two regression equations
(c) The coefficient of correlation between the marks in Economics and Mathematics.
(d) The most likely marks in Mathematics when marks in Economics are 30

Marks in Economics	25	28	35	32	31	36	29	38	34	32
Marks in Mathematics	43	46	49	41	36	32	31	30	33	39

- 4(a) Draw a diagrammatic representation of the methods of determining Simple Correlation.
(b) The ranks of 15 students in two subjects say Statistics and Physics are given below; the two numbers within the brackets denoting the ranks of the same student in Statistics and Physics respectively $(1,10), (2,7), (3,2), (4,6), (5,4), (6,8), (7,3), (8,1), (9,11), (10,15), (11,9), (12,5), (13,14), (14,12), (15,13)$. Use Spearman's Rank formula to find the Rank Correlation Coefficient.

- 5(a) A Psychologist wanted to compare two methods A and B of teaching. He selected a random sample of 22 students. He grouped them into 11 pairs so that the students in a pair have approximately equal scores on an intelligence test. In each pair one student was taught by method A and the other by method B, and examined after the course. The marks obtained by them are tabulated below:

Pair	1	2	3	4	5	6	7	8	9	10	11
A	24	29	19	14	30	19	27	30	20	28	11
B	37	35	16	26	23	27	19	20	16	11	21

Use the method of repeated ranks in Spearman's Rank Correlation to compare the methods.

(b) Define the following terms:

- (i) Random Experiment
- (ii) Independent Events
- (iii) Mutually Exclusive Events

6(a) Show that $\binom{n}{r} = \binom{n-1}{r} + \binom{n-1}{r-1}$

- (b) How many different permutations can be made from the letters of the word **MISSISSIPPI**.
- (c) What are the conditions a probability experiment must satisfy, for it to be a Binomial experiment.

7(a) An Archer hits the bull's eye 80% of the time. If he shoots 5 arrows, find the probability that he will get 4 bull's eyes.

(b) A die is rolled 3 times. Construct a probability distribution for the number of fives(5's) that will occur.

(c) If there are 150 typographical errors randomly distributed in a 600- page manuscript, find the probability that any given page has exactly two errors.

(d) Find the mode of the following numbers: **2,3 ,3, 3, 4, 4, 6, 6,6, 8, 9 and 10.**