COURSE CODE: MBA 816   **CREDIT UNITS: 2**

COURSE TITLE: BASIC MATHEMATICS AND STATISTICS FOR MANAGERS

TIME ALLOWED: 2 HOURS

Instructions: 1. Attempt question number one (1) and any other two (2).

       2. Question number 1 is compulsory and carries 30 marks while the other 2 questions carry 20 marks each.

       3. Present all your points in coherent and orderly manner.

1(a) A Ship travels between two ports. The cost of fuel is $100(ax + b/x + 10)$ naira, where x is the average speed of the Ship in knots, and a and b are constants. If the Ship travels at 4 knots, the cost of fuel would be N9,000, but at 6 knots, the cost would be N7,000.

(i) Find the values of a and b

(ii) What is the cost of fuel at an average speed of 5 knots?

(15 marks)

(b) The followings are data on the number of stores that purchase bottled water in the cities as listed: Sokoto 25,000   Lagos 20,000   Enugu 20,000   Port Harcourt 5,000, summarise these information using a pie chart.

(15 marks)

2. The followings are data on annual gross revenue of a Company:

Year	t	Gross Revenue (N'millions) (y)	ty	t^2
1987	1	13.0	13	1
1988	2	14.1	28.2	4
1989	3	15.7	47.1	9
1990	4	17.0	68	16
1991	5	18.4	92	25
1992	6	20.9	125.4	36
1993	7	23.5	164.5	49
1994	8	26.2	209.6	64
1995	9	29.0	261	81
1996	10	32.8	328	100
	$\sum t = 55$	$\sum y = 210.6$	$\sum ty = 1336.8$	$\sum t^2 = 385$

(a) Sketch the data on your answer script

(b) Compute the règression equation, using y as dependent variable and t as independent variable.

(c) Find the trend forecasts for the years 1999, 2001, 2004, and 2006

(20 marks)

3(a) The annual income of a bank clerk is N240,000. His income tax is charged at 10 percent, and the employer deducts 5 percent for the Pension fund. Calculate the clerk's net monthly income.

(b) Using the expression for the nth term of a geometric progression, compute the 8th term of the geometric progression: 72, -24, 8, ...

(20 marks)

4. Given the income distribution of a sample of 50 MTN customers as follows:

Income (N'000s)	Number of Subscriber
20 – 30	20
31 – 41	15
42 – 52	10
53 – 63	5

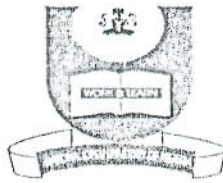(a) Compute the arithmetic mean of the incomes;

(b) Compute the Median income

(20 marks)

5. A total of N10,000 was invested in two business ventures, A and B. At the end of the first year, A and B yielded returns on the original investments of 6 percent and 5.75 percent respectively. How was the original amount allocated if the total amount earned was N588.75?

(20 marks)

NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
OCTOBER 2013 EXAMINATION

COURSE CODE: MBA 816
CREDIT UNIT: 2
COURSE TITLE: BASIC MATHS AND STATISTICS FOR MANAGERS
TIME ALLOWED: 2.5 Hours

Instructions: 1. Attempt question Number one (1) and any other two (2).
2. Question number 1 is compulsory and carries 30 marks, while the other questions carry equal marks each
3. Present all your points in coherent and orderly manner

QUESTIONS:
1. An economist presents the following data on weekly output and costs of standard statistics textbooks:

Week	1	2	3	4	5	6	7	8	9	10
Output, x(000s)	20	2	4	23	18	14	10	8	13	8
Total cost, y(N'000s)	60	25	26	66	49	48	35	18	40	33

(a) Plot a scatter diagram of the data.
(b) Compute the least-squares regression equation or line for the total costs and outputs.
(c) Using the computed regression equation, what is your estimate of the total cost of producing 25,000 standard textbooks?
(d) What is your estimate of the fixed cost of production, using the regression equation?

(30 marks)

2(a) What is the value of the 8th term in a geometric progression with first term 20 and common ratio 1/3?
(b) The sum of the first 10 terms of an arithmetic progression is -145 and the common difference is 4.5. What is the value of the 6th term?

(20 marks)

3(a) In a market survey it was discovered that within Bello city way 6 exercise books (x) and 12 biros (y) cost N144. In another city it was discovered that 8 exercise books and 10 biros cost N132. Determine the quantities x and y.

(b) The ages of a sample of 5 patients in a clinic are recorded as: 38yrs 26yrs 13yrs

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41yrs and 22yrs. What is the standard deviation of ages of the patients?

(20 marks)

4(a) The annual income of a bank clerk is N240,000. His income tax is charged at 10 percent, and the employer deducts 5 percent for the Pension fund. Calculate the clerk's net monthly income.

(b) Using the expression for the nth term of a geometric progression, compute the 8th term of the geometric progression: 72, -24, 8, ...

(20 marks)

5. Given the income distribution of a sample of 50 customers as follows:

Income (N'000s)	Number of Subscriber
20 – 30	20
31 – 41	15
42 – 52	10
53 – 63	5

(a) Compute the arithmetic mean of the incomes;

(b) Compute the Median income

(20 marks)

COURSE CODE: BHM711   CREDIT UNIT: 2

COURSE TITLE: BASIC MATHS AND STATISTICS FOR MANAGERS

TIME ALLOWED: 2 hrs

Instructions:

1. Attempt question Number one (1) and any other two (2).

2. Question number 1 is compulsory and carries 30 marks, while the other questions carry equal marks each

3. Present all your points in coherent and orderly manner.

1 (a) The length of a one-room apartment is 8 metres more than width. If the area of the apartment is 48 square metres what are the dimensions?

(15 marks)

(b) Joe and Nick are to share N54 such that Joe has N8 less than Nick. What are the shares of Joe and Nick?

(15 marks)

2. Discuss in detail the various techniques of statistical sampling. What are the various techniques used in data collection?

(20 marks)

3 (a) Solve for X in 30X + 10 +2X = 15X + X + 42

(10 marks)

(b) The demand function for bread in markets x and y is given by 3x – 4y = 19 and x - 2y = 5 respectively. Solve for the variables x and y   (10 marks)

4. (a) A commercial bank pays its salespersons either N6.50, N7.50, or N8.50 with the corresponding weights given as 14, 10, and 2 respectively. What is the average payment to the salespersons?   (10 marks)

(b) The ages of a sample of 5 patients in a clinic are recorded as: 38yrs, 26yrs, 13yrs, 41yrs, and 22yrs. What is the standard deviation of ages of the patients?

(10 marks)

5. The followings are data on the number of stores that purchase bottled water in the cities as listed: Jos 25,000   Abuja 20,000   Akure 20,000   Akwa Ibom 5,000, summarise these information using a pie chart.   (20 marks)