



EDO UNIVERSITY, IYAMHO, EDO STATE
FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS/ICT

Second Semester Examination, 2016/17 Session

Course Title: **Applied Statistics** Course Code: **MTH 223**

Time allowed: **2hours, 30 minutes** Instruction: **Answer any five (5) questions** Date: **12-09-2017**

1(a) The table below shows the distribution of 50 spectators in a secondary school sports competition. You are required to represent the data with a histogram. (7 Marks)

Age(years)	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Frequency	2	3	5	7	11	8	6	5	3

(b) An hotel has three(3) departments A, B, C from where sales are made and the annual records of the net profit of the departments for three consecutive years are as presented below:

Years	Net Profits in the Departments (in Millions of Naira)		
	A	B	C
1999	3.2	3.4	2.8
2000	2.8	3.0	2.6
2001	4.0	3.2	3.6

Represent the values of the Net profits with the aid of a Component and Multiple bar Charts. (7 Marks)

2(a) List out the steps for the computation and for drawing conclusions in a chi-square (χ^2) test. (6 Marks)

(b) The following figures show the distribution of digits in numbers chosen at random from a telephone directory:

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency	1,026	1,107	997	966	1,075	933	1,107	972	964	853	10,000

Tests whether the digits may be taken to occur equally frequently in the directory. (Hint: Table value of χ^2 for 9 d.f at 5% level of significance is 16.92). (8 Marks)

3(a) Two independent random samples are drawn from normal populations with the same variance. The sample results are given below:

$$n_1 = 4, \bar{X}_1 = 12, S_1^2 = 4, n_2 = 5, \bar{X}_2 = 10, S_2^2 = 3.$$

Where S_1^2 and S_2^2 are unbiased estimates of the common population variance σ^2 . Obtain 90% confidence interval for $\mu_1 - \mu_2$. (10 Marks)

(b) List the importance of Statistical Analysis. (4 Marks)

4(a) Write a short note on the Analysis of Variance (ANOVA). (3 Marks)

(b) To test the hypothesis that the average number of days a patient is kept in the three (3) local hospitals, say A, B, and C is the same, a random check on the number of days that seven patients stayed in each hospital reveals the following:

Hospital A:	8	5	9	2	7	8	2
Hospital B:	4	3	8	7	7	1	5
Hospital C:	1	4	9	8	7	2	3

Test the hypothesis at $\alpha = 0.05$.

(5% level of significance for F value is 3.55).

(11 Marks)

5(a) Calculate the mean for the following frequency distribution.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	6	5	8	15	7	6	3

- (i) By direct method. (4 Marks)
 (ii) By Step deviation method. (7 Marks)

(b) Find x , if the mean of $x, 2, 3, 4, 8$ is 4 . (3 Marks)

6(a) Calculate the mean deviation and mean for the following data. (7 Marks)

Class Interval	2-4	4-6	6-8	8-10
Frequency	3	4	2	1

(b) In the frequency distribution of 100 families given below, the number of families corresponding to expenditure groups 20-40 and 60-80 are missing from the table. However, the median is known to be 50. Find the missing frequencies. (7 Marks)

Expenditure	0-20	20-40	40-60	60-80	80-100
No. of families	14	?	27	?	15

7(a) From the following data, obtain the regression equation of x on y and of y on x . (12 Marks)

Sales	91	97	108	121	67	124	51	73	111	57
Purchases	71	75	69	97	70	91	39	61	80	47

(b) The most likely purchase when sales is 60. (2 Marks)