FACULTY: BASIC AND APPLIED SCIENCES
DEPARTMENT: MATHEMATICS AND COMPUTER SCIENCE
SECOND SEMESTER EXAMINATIONS (JULY 2016)
2015 / 2016ACADEMIC SESSION

COURSE CODE: MTH 214

COURSE TITLE: INTRODUCTION TO STATISTICS

DURATION: 2 Hours

HOD's SIGNATURE

INSTRUCTIONS:

1. YOU ARE TO ANSWER **FOUR** QUESTIONS OUT OF **SIX**
2. SEVERE PENALTIES APPLY FOR MISCONDUCT,CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING THE EXAM
3. YOU ARE NOT ALLOWED TO BORROW CALCULATORS AND WRITING MATERIALS

Q1. (a) Define the following terms: (i) Sample (ii) Random sample. (**2 Marks**)

(b) The heights of forty (40) students at Elizade University, Ilara- Mokin to the nearest centimeter are given below.

163 178 167 170 176 182 178 159

173 174 168 171 166 176 175 164

171 155 167 168 169 163 174 180

160 157 182 167 184 165 167 162

172 170 158 165 179 159 181 164

(i) Using the class interval $155 - 159, 160 - 164, 165 - 169$ etc to constuct the frequency table. (**3 Marks**)
(ii) Identify the Median class. (**1 Mark**)
(iii) Construct a histogram for the distribution. (**3 Marks**)
(iv) Use interpolation to calculate the median. (**6Marks**)

Q2. (a) According to the Faculty of Agriculture FUTA, Ondo state, ten to twenty earthworms per cubic foot is a sign of healthy soil, Dr. Paul of the department checked the soil in his garden by digging 7 one –cubic holes and counting the earthworms. He found the following counts 4, 23, 15, 10, 8, 12, 18 . Calculate the sample variance and sample standard deviation of the numbers of earthworms per cubic foot. (**6 Marks**)

(b) Construct a histogram for the distribution below:

Heights	$110 - 129$	$130 - 139$	$140 - 149$	$150 - 159$	$160 - 169$
Frequency	110	90	100	150	50

Hence construct the frequency polygon for the distribution. (**9 Marks**)

Q3. (a) Calculate the standard deviation for the following distribution of marks given below taking the assumed mean as 2 .

Marks	$1 - 3$	$3 - 5$	$5 - 7$	$7 - 9$
Number of students	40	30	20	10	(**6 Marks**)

(b) Consider the table below and use it to (i) State the Modal class (**2 Marks**)

(ii) Estimate the Mode of the distribution correct to one (1) decimal place (**7 Marks**).

Mass/kg	55-59	60-64	65-69	70-74	75-79	80-89	90-94	95-99	100-104
Frequency	2	6	9	23	25	13	6	5	1

Q4(a) Define the following terms (i) Independent Events (ii) Conditional Probability **(5Marks)**

(b) If the independent probabilities that three people X, Y and Z will be alive in $10 years' time$ are $0.2, 0.3, and\ 0.4$ respectively. Calculate the probability that in 10 years' time (i) all will be alive (ii) None will be alive (iii) Only one will be alive (iv) At least one will be alive. **(10 Marks)**

Q5 (a) Define the following concepts (i) Mutually Exclusive Events (ii) Dependent Events

(4Marks)

(b) A man and his wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $\frac{1}{7}$ and the probability of wife's selection is $\frac{1}{5}$ .Determine the probability that only one of them is selected. **(6 Marks)**

(c) A speaks truth in 75% of cases and B in 80% of cases. In what percentage of cases are they likely to contradict each other, narrating the same incident? **(5 Marks)**

Q6, (a) If three fair coins are tossed; determine the exhaustive list of the sample elements in the sample space by using a tree diagram. **(4Marks)**

(b) In a single throw of a fair die, find the probability that (i) An even number appears

(ii) an odd number appears (iii) a prime number appears (iv) a perfect square appears

(v)   7 appear. **(10 Marks)**