



ELIZADE UNIVERSITY

ILARA-MOKIN

FACULTY: BASIC AND APPLIED SCIENCES
DEPARTMENT: MATHEMATICS AND COMPUTER SCIENCE
2nd SEMESTER EXAMINATION
2013 / 2014 ACADEMIC SESSION

COURSE CODE: MTH 206

COURSE TITLE: Probability and Statistics

COURSE LEADER: Professor Peter K. Oriogun

DURATION: 2 Hours

A rectangular box containing a handwritten signature in black ink, which appears to be "Peter K. Oriogun".

HOD's SIGNATURE

INSTRUCTION:

Candidates should answer ALL the (FOUR) Questions on this Paper.
For each Question 25 marks are available.

Students are warned that possession of any unauthorized materials in an examination is a serious assessment offence

Students are permitted to use ONLY a scientific calculator.

Question 1

- a) In a card game a player needs to draw two cards of the same suit to win the game. Of the 52 cards there are 13 cards in each suit. Suppose that the player draws a heart. Find the probability that the player draws a second heart and wins the game. (12marks)
- b) Suppose an individual applying to a college has an 80% chance of being accepted and he knows that dormitory housing will only be provided for 60% of all the accepted students. Find the probability of the student being accepted and receiving dormitory housing. (13marks)

Question 2

- a) There are 12 boys and 14 girls in Mrs Akinwumi's MTH102 class. Find the number of ways Mrs Akinwumi can select a team of 3 students from the class to work on a group project together. The team is to consist of 1 girl and 2 boys. (13marks)
- b) What is the total number of possible five letter arrangements that the letters m, a, t, h, s, if each letter can only be used once? (12marks)

Question 3

- a) Provide the expected value $E(X)$ for the probability density function of a random variable X . (5marks)

b) Hence if $f(x) = \begin{cases} (1-x)^2, & 0 < x < 4 \\ 0, & \text{otherwise} \end{cases}$

Find the expected value $E(X)$ of the probability density function given above. (10marks)

- c) A fair dice is thrown four times. Find the probability of scoring 4 twos. (10marks)

Question 4

- a) Suppose that scores on an IQ test are normally distributed. If the test scores have a mean of 100 and a standard deviation of 10 what is the probability that a person who takes the test will score between 90 and 110. (10marks)
- b) Births in a hospital occur randomly at an average rate of 1.8 births an hour. What is the probability of observing the following?
- (i) More than or equal to 2 births in a given hour at the hospital? (10marks)
- (ii) 4 births an hour at the hospital? (5marks)