ALUPE UNIVERSITY COLLEGE

...*Bastion of Knowledge*...

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OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2018 /2019 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE (APPLIED STATISTICS WITH COMPUTING)

COURSE CODE: STA114

COURSE TITLE: COMPUTER APPLICATIONS FOR
DATA ANALYSIS

DATE: 23/4/2019   **TIME: 9.00 AM - 12.00 PM**

INSTRUCTION TO CANDIDATES

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THIS PAPER CONSISTS OF 5 PRINTED PAGES   **PLEASE TURN OVER**

REGULAR – MAIN EXAM

STA 114: COMPUTER APPLICATIONS FOR DATA ANALYSIS

STREAM: ASC   **DURATION: 3 Hours**

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INSTRUCTION TO CANDIDATES
Answer **ALL** questions from section A and **ANY THREE** Questions in section B.
All questions in section B carry Equal Marks
Duration of the examination: 3 hours

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QUESTION ONE (16 Marks)

(a) Define the following terms;

i) A computer   [1Mark]

ii) Data   [1Mark]

iii) Information   [1Mark]

iv) Operating System   [1Mark]

(b) Distinguish between a database and a database management system.   [2Marks]

c) i) Define the term interpolation;   [2Marks]

ii) Show that the linear function $g(x) = Ax + B$ is given by

$$g(x) = xF(xo)\frac{(x_1-x)}{x_1-x_0} + F(x_1)\frac{(x-x_0)}{x_1-x_0}$$ [4Marks]

d) In an SPSS software explain the difference between variable view and data view;   [2Marks]

e) Calculate the following binary addition;   [2Marks]

$(1100110011)_2 + (110011111)_2$

QUESTION TWO (15 marks)

a) Discuss five computer generations and the components used   [5Marks]

b) Estimate the value of u_3 from the following table by method of differencing method.

[4Marks]

STA 114

X	1	2	3	4	5
u_x	3	9	?	20	37

c) Convert the following

    i. 147_{10} (decimal numbers to binary numbers)   [2Marks]

    ii) $11001001111 01_2$ (decimal numbers to binary numbers)   [2Marks]

d) Discuss the three levels of Data Abstraction   [3Marks]

SECTION B (39 marks):

Answer any THREE questions. All Questions carry equal marks

QUESTION THREE (13 marks)

a) After logging on to windows 7, describe how to start SPSS software.   [3Marks]

b) In the middle of the **Data Editor** screen you can see another window with the following options. Explain the importance of each options;

    i)   New files   [1Mark]

    ii)   Recent files   [1Mark]

    iii)   Whats New   [1Mark]

    iv)   Tutorials   [1Mark]

c) The computer system consists of three units: Explain the function of each unit.

    i)   Input device   [2Marks]

    iii)   Central Processing Unit (CPU)   [2Marks]

    iv)   Output device   [2Marks]

QUESTION FOUR (13 marks)

a) Use the value at x_0 and x_1 to get an interpolated value at x= 0.4. Assume that x_0=0.2 and x_1=0.5 , hence find f(0.2), g(0.4),f(0.5) and e(0.5)   [6Marks]

X	0.2	0.4	0.5	0.6
f(x)=2x+1	?	g(0.4)=?	?	?

b) Show that $\Delta^3 y_0 =$ is given by $y_3 - 3y_2 + 3y_1 - y_0$ [3Marks]

c) Express the $\Delta^6 y_0$-operator in terms of $E-$ operator , given that $\Delta^6 y_0 = (E-1)^6 y_0$ [2Marks]

d) Explain the difference between entity and attribute?   [2Marks]

QUESTION FIVE (13 marks)

a) The yearly averages of death of infants less than 1 year in Kenya are shown below. Find the estimate of missing terms. [5Marks]

Year	1950	1951	1952	1953	1954	1955
No. of deaths	400	263	?	254	278	?

b) Solve the unknown values in the following system of equations by gauss elimination. [5Marks]

$$x - 4y + 5z = 36$$
$$-3x + 5y + 2z = 7$$
$$3x + 3y - 8z = -31$$

c) Given $f(x) = x^2 + x - 6$ and the roots lies in the initial [0, 3].

   i) Find initial approximation to the root using the bisection method. [2Marks]

   ii) Find the second approximation [1Marks]

QUESTION SIX (13 marks)

a) The entire structure of a database can be described using a data model.

   i) Define the term data model; [2Marks]

   ii) List and explain three types of data models [6Marks]

b) Convert 11010.01_2 to decimal [2Marks]

c) Calculate

   i)   Subtract 100011_2 from 010010_2 [2Mark]

   ii)   Add $(1100110011)_2$ and $(110011111)_2$ [1Mark]

QUESTION SEVEN (13 marks)

a) Define the following terms as used in data representation.

   i)   Bits [1Mark]

   ii)   Byte [1Mark]

   iii)   Nibble [1Mark]

   iv)   word [1Mark]

b) Given $u_1 = (10 - x)(6 - x), u_2 = (5 - x)(4 - x), u_3 = (x + 18)(x + 6) \text{ and } u_4 = 80.$

Find the values of x such that 2nd degree difference of u are constant. [5Marks]

c) Show that E is given as $\Delta + 1$ using equation i) $\Delta_{yr} = y_{r-1} - y_r$ and ii) $E_{yr} = y_{r+1}$

[2Marks]

d) Using a well labeled diagram explain the difference between a field and a tuple in a database? [2Marks]

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