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**ALUPE UNIVERSITY**  
COLLEGE  
*Bastion of Knowledge...*

P.O.Box 845-50400 Busia(K)  
principal@auc.ac.ke  
Tel: +254 741 217 185  
+254 736 044 469  
off Busia-Malaba road

**OFFICE OF THE DEPUTY PRINCIPAL  
ACADEMICS, STUDENT AFFAIRS AND RESEARCH**

**UNIVERSITY EXAMINATIONS**

**2017/2018 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATION**

**FOR THE DEGREE OF BACHELOR  
OF EDUCATION (ARTS/SCIENCE)  
SCHOOL: EDUCATION AND  
SOCIAL SCIENCES**



**COURSE CODE: PSY 110**

**COURSE TITLE: QUANTITATIVE TECHNIQUES  
IN EDUCATION**

**DATE: 19<sup>th</sup> December, 2017 TIME: 9.00am-12.00pm**

**For examiner's Use Only**

Question	I.E	E.E
CAT		
EXAM		
TOTAL		

**INSTRUCTION TO CANDIDATES: SEE INSIDE**

**THIS PAPER CONSISTS OF 20 PRINTED PAGES**

**PLEASE TURN OVER**

Insert the numbers of the questions you have answered in the order done

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Student Admission No.....Exam Card No.....Signature.....

**INSTRUCTIONS TO CANDIDATES**

1. Write your **Admission Number**, **Exam Card Number** and **Sign** in the spaces provided at the bottom of each page of the Examination Booklet. DO NOT write your name anywhere in this booklet.
2. Write on both sides of the pages.
3. All rough work must be done in the Answer sheets and crossed through.
4. If supplementary pages are used, they must be fastened all together at the end of this Booklet. Supplementary pages should be used only after all the leaves in the booklet have been exhausted.
5. It is a serious examination offence to cheat or to have unauthorized materials including **MOBILE PHONES** (whether on or off) in the examination venue.
6. In no circumstances must Answer Booklet used or unused, be removed from the examination room by a candidate.
7. The Booklet is for **Examination use only** in a designated examination room. Unauthorized possession of the Answer sheets by a student or any other person constitutes an examination irregularity calling for stiff disciplinary action.
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9. Candidates who come to examination room 30 minutes late will not be allowed to sit for the exam.
10. Candidates will not be allowed to leave the exam room once the exam commences.
11. Candidates are advised that importance is attached by examiners to accuracy and clarity of expression.
12. Committing any form of irregularity is prohibited and shall attract severe disciplinary action in accordance with Alupe University College Examination Regulations.

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**INSTRUCTIONS TO CANDIDATES**

- Answer Question **ONE** and any other **TWO** questions
- Question ONE carries 30 marks
- Time allowed: 3 hours

**Question One (30 Marks)**

a) Explain with examples what is:

- (i) A set (2mks)
- (ii) A Venn diagram (2mks)
- (iii) A universal set (2mks)
- (iv) A Disjoint – set (2mks)
- (v) A Subset (2mks)

b) (i) Verify that  $(A \cup B)^c = A^c \cap B^c$  (5mks)

Given that:

$$U = \{3, 4, 5, 6, \dots, 12\}$$

$$A = \{3, 4, 8, 9\}$$

$$B = \{4, 5, 7, 9, 10\}$$

$$C = \{3, 4, 5, 6, 8, 9\}$$

$$D = \{4, 6, 8, 11\}$$



Basing on the sets given above, evaluate the following:

- (ii)  $C \cup (B \cup A)^c$  (2mks)
  - (iii)  $B \cap (A \cup C)$  (2mks)
  - (iv)  $B \cap \phi$  (2mks)
  - (v)  $B \cup B^c$  (2mks)
- c) An ice cream parlor wanted to know what flavor most popular. A survey of 100 customers revealed that 56 customers liked vanilla, 55 customers liked chocolate and 59 customers liked

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strawberry, 43 customers liked vanilla and chocolate, 41 liked vanilla and strawberry, 40 liked strawberry and chocolate, 30 customers liked all the three of the flavors:

- (i) How many customers liked vanilla or chocolate? (2mks)
- (ii) How many customers liked none of these flavors? (2mks)
- (iii) How many customers liked only one flavor? (2mks)
- (iv) How many did not like vanilla? (2mks)

**Question Two (20 Marks)**

- a) Distinguish between discrete and continuous data. (5mks)
- b) 250 members of a certain society have voted to elect a new chairman. Each member may vote for either one or two candidates. The candidate elected is the one who polls most votes. Three candidates x, y z stood for election and when the votes were counted, it was found that

- 59 voted for y only, 37 voted for z only
- 12 voted for x and y, 14 voted for x and z
- 147 voted for either x or y or both x and y but not for z
- 102 voted for y or z or both but not for x (15mks)

- i. How many voters did not vote
- ii. How many voters voted for x only
- iii. Who won the elections

**Question Three (20 Marks)**

The managers of an import agency are investigating the length of time that customers take to pay their invoices, the normal terms for which are 30 days net. They have checked the payment record of 100 customers chosen at random and have compiled the following table: (20mks)

Payment in	Number of customers
5 to 9 days	4
10 to 14 days	10
15 to 19 days	17
20 to 24 days	20
25 to 29 days	22
30 to 34 days	16

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35 to 39 days	8
40 to 44 days	3

**Required:**

- a) Calculate the arithmetic mean. (6mks)  $A = \frac{\sum f_i x_i}{N}$
- b) Calculate the standard deviation (6mks)  $\sqrt{\frac{\sum f_i d^2}{N} - \left(\frac{\sum f_i d}{N}\right)^2}$
- c) Construct a histogram and insert the modal value. (8mks)

**Question Four (20 Marks)**

A police radar unit measured the speed of 25 cars on a certain street. The resulting speeds were: 29, 23, 30, 30, 27, 24, 30, 25, 23, 28, 25, 24, 28, 30, 23, 30, 27, 25, 29, 24, 23, 26, 30, 28, 25

- a) Prepare a frequency distribution for this data. (4MKS)
- b) Draw a bar graph to represent this data. (4MKS)
- c) Construct a line graph using the above data. (4MKS)
- d) Use the frequency distribution to determine the median and mode speeds. (4MKS)
- e) Use the frequency distribution to find the mean of all the speeds. (4MKS)



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