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**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 SCIENCE IN COMPUTER  
SCIENCE/MICROBIOLOGY/  
COMM&P.RELAT/MED. LAB SCI.  
/PT/APPLIED STA.WITH COMPUTING  
SCHOOL: HEALTH SIENCES/SBEHRD**

**COURSE CODE: IRD 101**

**COURSE TITLE: QUANTITATIVE SKILLS I**

**DATE: 21<sup>st</sup> December, 2017 TIME: 9.00am-12.00pm**

For examiner's Use Only

Question	I.E	E.E
CAT		
EXAM		
<b>TOTAL</b>		

**INSTRUCTION TO CANDIDATES : SEE INSIDE**

**THIS PAPER CONSISTS OF 22 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.
8. Do not pluck any page from this Booklet. Any extra/unused answer sheets should be returned to the **Examination Office**.
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) Solve for x
- i)  $\text{Log } 10^{3x-1} = \log 2^{2x+1}$  (2MKS)
- ii)  $\text{Log}_4 (3x - 5) = 0$  (2MKS)
- b) Let  $A = \{2,3,4\}$ ,  $B = \{2,5,6\}$ ,  $C = \{5,6,2\}$  and  $D = \{6\}$
- i) Determine which of the following statements is true (4MKS)
- $4 \in C$ ,  $5 \in C$ ,  $AC = B$ ,  $B = C$
- ii) Find  $A \cup B$ ,  $A \cap B$ ,  $A \cap B \cap C$  (3MKS)
- c) Enumerate all the subsets of the set  $\{5, 6, 7\}$  (3MKS)
- d) Calculate the arithmetic mean, media and mode from the data given below (6MKS)

Daily wages	No of workers
30-35	5
35-40	8
40- 45	10
45-50	6
50-55	3
55-60	2

- e) Office equipment was purchased for Ksh. 20,000 and is assumed to have a scrap value of Ksh.2, 000 after 10 years. If its value is depreciated linearly (for tax purposes) from Ksh.20, 000 to ksh.2, 000:
- i) Find the linear function that relates value (V) in Kenya shillings to time (T) in years. (7MKS)
- ii) What would be the value of the equipment after 6 years? (3MKS)

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**Question Two**

Of the cars sold during the month of August 90 had air conditioning, 100 had automatic transmissions, and 75 had power steering. 5 cars had all three of these. 20 cars had none of these. 20 cars had only air conditioning, 60 cars had only automatic transmissions, and 30 cars had only power steering. 10 cars had both automatic transmission and power steering.

- i) Illustrate the above the above information in form of Venn diagram (10mks)
- ii) How many cars had both power steering and air conditioning? (4mks)
- iii) How many had both automatic transmission and air conditioning? (4mks)
- iv) How many had neither power steering nor automatic transmission? (4mks)
- v) How many cars were sold in August? (4mks)
- vi) How many had automatic transmissions or air conditioning or both (4mks)

**Question Three**

- a) Explain the four components of time series (8mks)
- b) The following data shows the number of wheat production in Eldoret county, calculate the trend values and plot them on a graph using '*semi-averages method*' (12mks)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	15522	17393	18901	20377	25244	27227	28769	31572	35196	41008

**Question Four**

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)

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- 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)

**Question Five**

- a) A professor records the following scores for a 100-point exam.  
99, 64, 80, 77, 59, 72, 87, 79, 92, 88, 90, 42, 20, 89, 42, 100, 98, 84, 78, 91  
Which measure of central tendency best describes these test scores? (5mks)

- b) Draw a graph for the following **sample** distributions (histogram and frequency polygon) using three different pairs of axes. (15mks)

Distribution 1		Distribution 2		Distribution 3	
Score	Frequency	Score	Frequency	Score	Frequency
25	4	1	25	2	8
26	10	2	31	4	20
27	6	3	40	6	25
28	3	4	44	8	35
29	3	5	51	10	40
30	1	6	19	12	45
53	1	7	10	13	24

- c) For each of the distributions in problem I, answer the following questions.
  - i) Is the curve of the distribution positively or negatively skewed? (2mks)
  - ii) Is the mode > median? Compute the answer and also answer it graphically, i.e., label the position of the mode and the median on the curve. (4mks)
  - iii) Is the mean > mode? Compute the answer and also answer it graphically as in part (b) of this question. (2mks)
  - iv) What is the variance of the distribution? (2mks)
  - v) What is the standard deviation of the distribution? (3mks)

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- vi) What is the range of the distribution? (2mks)
- vii) Which measure of central tendency, mode, median, or (arithmetic) mean, is the fairest and clearest description of the distribution? Why? (2mks)

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