IRD 101. QUANTITATIVE SKILLS I (Main Exam)

SECTION A: COMPULSORY) (25 MARKS)

1. (a) (i) Find the simplest value of
   $Log_3 (2187)$
   (2marks)

   (ii) Find the value of x so that
   $3Log_b2 + 1/4Log_b25 + Log_b20 = Log_bX$
   (2 marks)

   (b) (i) List a set of integers and set odd numbers.
   (ii) Differentiate between deciles and quartiles.
   (2 mark)
   (2 marks)

   (c) A furniture shop makes tables and chairs. The cost of making 8 tables and 5 chairs is sh.1400. The cost of making 3 tables and 7 chairs is sh.730. The shop makes a profit of 30% and 40% on each table and chair respectively.

   i. Express the above cost of making a table and chair in form of simultaneous equations.
   (2 marks)
   ii. Calculate the cost of making a table and a chair.
   (1-mark)
   iii. Calculate the selling price of a table and a chair.
   (1 mark)

   (d) (i) State the advantages of presenting data inform of graphs.
   (2 marks)
   (ii) State two situations where median is used as a measure of central tendency can be the most suitable to use.
   (2 marks)

   (e) (i) Describe two methods of primary data collection.
   (2 marks)
   (ii) Differentiate Discrete and Continuous variables.
   (2 marks)
   (iii) State the uses of mean and mode of sales of a product in a manufacturing company.
   (2 marks)

   (f) A factory employs 100 workers on whom 60 work in the first shift and 40 work in the second shift. The average wage of all the 100 workers in Kshs 38. If the average wage of 60 workers of the first shift is Ksh. 40 find the average wage of the remaining 40 workers of the second shift.
   (3 marks)

SECTION B. (ANSWER ANY THREE QUESTIONS)

Attempt any THREE Questions from this section.

QUESTION TWO(15 MARKS)

The following is an extract of monthly record of electricity in the thousand Kilowatt hours consumed by Batt enterprise for past 5 years.

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100   150   149   105   109   101   160   200   105   205   210
111   114   131   121   123   133   129   149   148   152   157
159   167   168   161   171   173   181   189   182   191   192
199   197   201   209   202   207   195   185   165   155   145
125   175   115   109   105   201   176   177   168   169   169
159   157   100   122   162   172   160   180   144   160   170
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a) Group the above data using inclusive form of grouping taking the class interval as 10 and begin at 100.
b) Determine the mean, median and mode of electricity consumed by Matt. (5 marks)
c) Calculate the standard deviation of electricity consumed by Matt. (4 marks)
d) Calculate the inter-quartile range and Quartile deviation. (3 Marks)
                                                                  (3 marks)

QUESTION THREE (15 MARKS)

A survey on tertiary examinations that was taken by 500 students revealed the number who passed as shown in the table below.
E represents English; K denotes Kiswahili and H denote History respectively.

Subject	E	K	H	EnH	KnH	EnK	EnKnH
No of students who passed.	262	232	239	130	120	118	70

Answer the following questions using the information given on the table above.

i. Use a Venn diagram to illustrate the information on regions in the table above. (2 marks)

ii. How many students passed Kiswahili or History or Both? $K \cup H$ (2 marks)
iii. The number of students who failed English and History. (2 marks)
iv. The number of students who failed in two subjects. $[E \cap H] \cup K$ (2 marks)
v. The number of students who failed in one subject. (2 marks)

vi. Find
   n (HnEnK)
   n (KnEuH)   (2marks)
   n (HuEnH)   (2 marks)
                                                              (1 mark)

$E \cap H = E \cap H^c$

QUESTION FOUR (15 MARKS)

Using matrix inverse or substitution or elimination method, solve the unknown in the following simultaneous equations.
(i) $3x + 5y - 7z = -19$
     $6x - 5y + 2z = 20$
     $4x + 7y + z = 59$
                                                              (7 marks)

(ii) Given the matrix

$$A = \begin{pmatrix} 1 \\ 4 \\ 4 \end{pmatrix} \quad B = \begin{pmatrix} 5 & 7 & 9 \\ 4 & 2 & 1 \\ 1 & 3 & 4 \end{pmatrix} \quad C = \begin{pmatrix} 7 & 3 \\ 1 & 7 \\ 4 & 1 \end{pmatrix}$$

(b) Compute.
   i.   AB   (2 marks)
   ii. BA   (2 marks)
   iii. CB   (2 marks)
   iv. BC   (2 marks)

QUESTION FIVE (15 MARKS)

The data below shows the amount of money earned by make side employees

(i) Construct a Lorenz curve using the data below;(8 marks)

   (ii) Using the Lorenz curve to estimate, what percentage of employees receive the first 20% total salary.   (3 marks)

   (iii) State the uses of Lorenz curve.   (4 marks)

Number of employees	Amount Salary (Shs 000)
8	6
60	8
100	6
108	10
72	22
32	20
12	20
8	28

QUESTION SIX(15 MARKS)

Firm's monthly sales in thousand shillings for the year 2012 and 2013 were as follows.

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2012	40	38	55	60	67	48	65	55	45	65	70	60
2013	45	48	50	35	60	44	70	65	55	49	75	65

   i. Draw a Z-chart   (6 marks)

   ii. Explain the purpose of the different parts of the graph.   (4 marks)

   iii. Comment on any particular feature of the graph you have drawn.   (2 marks)

(c) State the advantage of presenting data using line graph over diagram.   (3 marks)