**ST HENRY’S COLLEGE NAMUGONGO**



**END OF TERM III EXAMINATIONS - 2023**

**S.5 SUB MATHEMATICS**

**DURATION: 2 HOURS 40 MINUTES**

**INSTRUCTIONS**

* *Answer all* **eight** *questions in section A and any* **four** *questions from section B*
* *All the additional questions attempted will not be marked*

**SECTION A.**

1. Given that , determine the values of and. (05 marks)
2. Find the value of in the following equations;
3. *(05 marks)*
4. Given that A and B are acute angles with and . Find the value of without using tables or calculators. *(05 marks)*
5. Solve for x in the expression + 1=8 (05 marks)
6. The roots of the equation are . Find the equation whose roots are .  *(15 marks)*
7. solve the simultaneous equations below using the matrix method
8. The 5th term of an arithmetic progression is 12 and the sum of the first 5 terms is 80. Determine the first term and the common difference. (05 marks)
9. The table below shows the students that reported on the first day of the term.

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Years** | | |
| **2016** | **2017** | **2018** |
| 1 | 75 | 85 | 120 |
| 2 | 86 | 108 | 125 |
| 3 | 150 | 160 | 180 |

Calculate the four-point moving average for the data. (05 marks)

**SECTION B ( Attempt only four (4) questions from this section )**

1. The table below shows the number of students per term enrolling in S.5 in Naalya S.S from 2013 to 2016.

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Term I** | **Term II** | **Term III** |
| 2013  2014  2015  2016 | 180  201  210  204 | 210  213  216  234 | 213  222  225 |

1. Calculate the 3 point moving totals and the 3 point moving average for the data.
2. On the same axes, plot the graphs of the termly enrolment and the 3 point moving averages.
3. Estimate the value of from your graph. *(15 marks)*
4. (a) probability distribution of a random variable X is shown in the table below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 |
|  | 0.1 | 0.3 |  | 0.2 | 0.1 |

Find;

1. The value of
2. (04 marks)
3. A continuous random variable has a probability density function defined by

Where is a constant, show that

1. The mean
2. The (11 marks)

11 (a) Given that and , find MN. (03 marks)

b). Musa and Bob went for shopping. Musa bought 2 kg of Rice, 1.5 kg of sugar and 3 kg of meat while Bob bought 1 kg of Rice, 0.5 kg of Tea leaves and 4 kg of meat. The cost per kg of Meat was 10,000/=, Rice was 3,000/=, sugar was 4,500/= and Tea leaves was 1,500/=.

1. Write down the matrices for the items bought and for the prices of the items. (02 marks)
2. Using the matrices, determine the difference in the expenditure of Musa and Bob. (10 marks)

12. Given that

1. Show that
2. Determine the possible values of in (i) above between and

if (06 marks)

(b) Solve the equation for (06 marks)

(c) Without using tables or calculator show that;(03 marks)

13. The table below shows the scores by 200 students in a mathematics test marked out of 40.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Scores | 1 – 5 | 6 -10 | 11 – 15 | 16 – 20 | 21 – 25 | 26 – 30 | 31 – 35 |
| Cumulative frequency | 3 | 22 | 60 | 129 | 174 | 195 | 200 |

1. Calculate the;
2. Mean score
3. Variance (10 marks)
4. Draw a histogram and use it to estimate the modal score. (05 marks)

14. The table below shows the cost of items used in baking bread and their weights in 2015 and 2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Years** | **2015** | | **2017** | |
| **Items** | **Price** | **Weight** | **Rice** | **Weight** |
| Wheat  Sugar  Milk  Eggs | 3,000  2,500  1,600  400 | 2  3  5  6 | 5,000  4,500  2,000  500 | 4  2  3  7 |

Using 2015 as the base year,

1. Calculate the price relatives for the items in 2017.
2. Find the weighted aggregate price index for the items in 2017.

If the price of a unit of bread is shs. 2,000 in 2017, find the price of bread in 2015.  *(15 marks)*

**END**