S475/1

SUBSID. MATHEMATICS

Paper 1

UGANDA MARTYR'S HIGH SCHOOL - LUBAGA

Uganda Advanced Certificate of Education

SUBSIDIARY MATHEMATICS

Paper 1

2 hours 40 minutes

INSTRUCTIONS TO CANDIDATES:

Answer **all** *the* **eight** *questions in section* **A** *and only* **four** *questions .*

Any additional question(s) answered will **not** *be marked.*

Each question in section **A** *carries* **5** *marks while each question in section* **B** *carries* **15** *marks.*

SECTION A: (40 MARKS)

Answer **all** *the questions in this section.*

1.Solve for x in the equation: $2^{2x} - 12(2^{x}) + 32 = 0$

(05 marks)

2. The table below shows the time taken by workers to perform a given task.

Time(minutes)	20-22	23-25	26-28	29-31	32-34	35-36
Number of workers	9	12	12	17	6	4

Calculate the median time taken by the workers. *(05 marks)*

3. The third term of a geometrical progression (G.P) is 10 and the sixth term is 80. Find the common ratio and the sum of the first six terms. *(05 marks)*

4. Mrs X goes to a shop with a 50,000 shillings note and buys 3kg of beans at shs 2,000 per kg, 5kg of posho shs 1,500 per kg and 2kg of sugar at shs 2,500 per kg.

(a) Write the;

(i) quantities bought as a row matrix.

(ii) prices as a column matrix.

(b) Use the matrices in (a) above to find the balance Mrs X received from the shopkeeper.

5 The table below shows the marks of 8 students in the midterm test and end of term test in economics.

Midterm test	99	71	30	67	77	71	96	72
End of term test	99	55	15	60	75	70	99	50

Calculate the spearman's rank correlation coefficient. Comment on your result. *(05 marks)*

6. Given that $\frac{3-\sqrt{5}}{1+3\sqrt{5}} = a + b\sqrt{5}$, determine the values of a and b.

7. The table below shows the students that reported on the first day of the term.

Term	**Years**		
	2015	**2016**	**2017**
1	70	80	120
2	85	105	115
3	140	150	170

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

8. The 5^{th} 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)

SECTION B: (60 MARKS)

Answer **four** *questions*

9. The roots of the equation $2x^2 + 5x - 8 = 0$ are α and β. Determine the:

(a) value of;

(i) $(\alpha + \beta)^2$

(ii) $\alpha^2 + \beta^2$

(iii) $\frac{1}{\alpha\ \beta} + \frac{1}{\alpha\ \beta}$ *(11 marks)*

(b) quadratic equation whose roots are α^2 and β^2 . *(04 marks)*

10. The table below shows the monthly sales of bags of sugar by a certain wholesale shop in the year 2017.

Month	**Sales**	**Month**	**Sales**	**Month**	**Sales**
January	84	May	92	September	100
February	64	June	70	October	81
March	61	July	63	November	72
April	82	August	85	December	96

(a) Calculate the four-month moving totals and hence the four- month moving averages for the data. *(06 marks)*

(b) (i) On the same axes, draw graphs of moving averages and the actual sales. Comment on the sales over the period.

(ii) Determine the number of bags of sugar expected to be sold in January 2018. *(09 marks)*

11. The times corrected to the nearest seconds, taken by 100 athletes to cover a lap of a running track were recorded as follows:

Time(s)	70-74	75-79	80-84	85-89	90-94	95-99
No of athletes	8	20	26	30	9	7

(a) Calculate the:
(i) mean; *(06 marks)*
(ii) standard deviation; *(05 marks)*

(b) Draw a histogram and use it to estimate the modal time. *(04 marks)*

12. (a) Given that $M = \begin{pmatrix} 1 & 3 \\ 2 & 0 \end{pmatrix}$ and $N = \begin{pmatrix} -3 & 1 \\ 3 & -2 \end{pmatrix}$, 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/=.

(i) Write down the matrices for the items bought and for the prices of the items. (02 marks)

(ii) Using the matrices, determine the difference in the expenditure of Musa and Bob. (10 marks)

GOOD LUCK