

ST POUL AND PAULINE`S S.S GAYAZA

End of Term II Examination

S.5 Subsidiary Mathematics

Time: $1\frac{3}{4}$ hours

Instructions

Answer all questions

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

All working must be shown clearly.

Graph paper is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A : (40 marks)

1. Solve for x: $3^{2x+1} - 3^{x+1} = 0$
2. Find the mean and variance of the following set of values.

2,1,3,4,5,6,7,8,9,10,3,4,6,8,9,6,3,2

3. The price relatives for five commodities A, B, C, D, and E for the year 2013 are shown below with their respective weights.

Commodity	A	B	C	D	E
Price relative	120	80	140	140	120
Weight	4	5	2	8	1

Calculate:

- i. Simple price index for 2013
- ii. Average weighted index number for 2013. Comment on your answer.

4. An A.P has the first term 3, common difference -2 and the n^{th} term 15. Find n and the $(n-3)^{\text{th}}$ term.
5. The table below shows the marks scored by eight students in two tests in English during the end of term calendar.

STUDENT	A	D	C	D
TEST 1	80	70	56	66
TEST 2	70	56	90	78

Calculate the rank correlation coefficient for the performance between TEST1 and TEST 2. Comment on the relationship of performance.

6. The table below shows the annual production of cotton in thousand kilograms in a certain area for the period 2000-2008.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
production	147	196	172	178	155	152	166	154	130

Calculate the 4 years moving average.

7. Solve for x : $\log_x^5 + 4 \log_5^x = 4$
8. Express $2\sqrt{3}-3\sqrt{2}$ in form of $a + b\sqrt{c}$.
- $$2\sqrt{3}+3\sqrt{2}$$

SECTION B

9. a) The roots of the equation $3x^2 - 5x + 1 = 0$ are p and q. Find the value of

$$p^2/q + q^2/p$$

5marks

b). The sum of a number of consecutive terms of an arithmetical progression is $-\frac{19}{2}$

the first term is $\frac{33}{2}$ and common difference is -3. Find the number of terms of the progression.

5marks

c). Given a geometric progression $8 + 24 + 72 + 216 \dots$

Find the least

number of terms of the progression that will give a sum greater than 6,000,000.

5marks

10). The test marks below shows the distribution of the heights of the students and their respective numbers in a certain school.

Heights	$0 < x < 10$	$10 < x < 20$	$20 < x < 30$	$30 < x < 40$	$40 < x < 50$	$50 < x < 60$	$60 < x < 70$	$70 < x < 80$	$80 < x < 90$
Frequency density	0.3	0.6	0.9	1.0	1.2	1.8	1.4	1.1	0.7

a). Calculate:

i. Mean mark

ii. Standard deviation

9marks

b). Construct the cumulative frequency curve and use to estimate the number students who scored below 58 marks.

6marks