UGANDA ADVANCED CERTIFICATE OF EDUCATION.
S.5 SUBSIDIARY MATHS
TIME: $2^{2}/_{3}$ HOURS.

INSTRUCTIONS
Attempt **all** questions **A** and any **four** from section **B**.

SECTION A

1. Given the matrices $A = \begin{bmatrix} -3 & 1 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -4 \\ 7 & 3 \end{bmatrix}$
Find $BA + 2I$ where I is a 2×2 identify matrix.

2. If $\propto$ and β are the roots of the quadratic equation $2x^2 + 3x - 10 = 0$ form a quadratic equation whose roots are $\frac{1}{\propto}$ and $\frac{1}{\beta}$.

3. The fifth term of an arithmetic progression is 12 and the sum of the first five terms is 12 and the sum of the first five terms is 80. Determine the first term and the common difference.

4. If $\cos x = p$, find in terms of p,
(i) $\sec x$
(ii) $\sin x$

5. Solve for the value of x in;
$3(3^{2x}) + 26(3^{x}) - 9 = 0$

6. Events A and B are such that $P(A) = \frac{19}{30}$, $P(B) = {}^{2}/_{5}$ and $P(A \cup B) = {}^{4}/_{5}$. Find;
(i) $P(A \cap B)$
(ii) $P(B/A)$

7. Find the gradient of a curve
$y = 2x^2 - 5x + 1$ $at\ the\ point$ $(-4,7)$

8. Given that $\frac{3^4 \times 3^8}{9 \times 3^7} = 3^{2x}$, find the value of x.

prepared by
Ssebalamu Erick Tom
0750547775

SECTION B

9. The times taken by a group of students to solve a mathematical problem are given below.

Time (min)	5-9	10-14	15-19	20-24	25-29	30-34
No of students	5	14	30	17	11	3

(a) Draw a histogram for the data. Use it to estimate the modal time for solving a problem.

(b) Calculate the mean time and the standard deviation of solving a problem.

10. (a) Find the coordinates for the intercepts of the curve $y = x^2 - 8x - 20$.

(b) Also, find the coordinate(s) of it's turning point, and distinguish it.

(c) Hence, sketch the graph of $y = x^2 - 8x - 20$.

11. The table below shows the percentage preference of nine most popular Holiday destinations as sampled by a tour company for two years 1998 and 1999.

Holiday destination	A	B	C	D	E	F	G	H	J
1998	90	80	78	78	50	40	80	20	10
1999	79	90	80	60	60	35	45	60	22

(i) Plot a scatter diagram for the data.

(ii) Calculate a rank correlation coefficient and comment on your results.

12. The table below shows the monthly production of cement in tones of a cement factory for the year 2006.

Jan	Feb	mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
130	220	580	260	169	280	610	250	170	290	610	260

(a) Calculate the four-month moving averages.

(b) On the same graph, plot the original data and the moving averages.

(i) Use the graph to estimate the production of cement in January 2007.

prepared by
Ssebalamu Erick Tom
0750547775

(ii) Comment on the trend of the company's cement production.

13. (a) Show that $(x-2)$ is a factor of x^4-2x^3-x+2.

(b) When the polynomial $8x^3+mx^2-6nx+m$ is divided by $x-1$ and $x-2$, the remainders are 2 and 7 respectively.
Find the values of m and n.

END

prepared by
Ssebalamu Erick Tom
0750547775