

2025 END OF SEMESTER EXAMS – MATHEMATICS (ELECTIVE) 2

FORM TWO

Answer **all** questions in section A and **four** questions in Section B

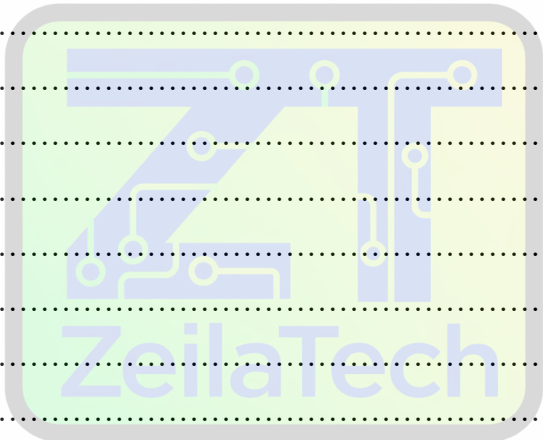
*In each question, all necessary details of workings, including rough work **must** be shown with the answer.*

Give answers as accurately as data and tables allow.

SECTION A

(30 Marks)

1. Simplify $\log_{10} x - \frac{1}{2}\log_{10} 2 = \frac{1}{2}\log_{10} (x + 4)$



2. Solve simultaneously $4^{2x+y} = \frac{1}{256}$ and $2^x \circ 4^y = 8$

[illegible]

SECTION B
(40 Marks)

6. a. Solve $3x^{\frac{1}{2}} + 5 - 2x^{\frac{-1}{2}} = 0$

b. if $\frac{1}{(a)^{y-1}} = 27^{(4-3x)}$ express y in terms of x

7. a. using a scale of 2cm to 20^0 on the x – axis and 2cm to 0.5 unit on the y – axis. Draw the graph of
f: $x \rightarrow 3\sin x + 2\cos x$ of $0^0 \leq \theta \leq 180^0$ at intervals of 20^0 .

b. Use the graph in (a) to find, correct to the nearest degree the truth set of

i. $3\sin x + 2\cos x + 1 = 0$

ii. $6\sin x + 4\cos x - 2 = 0$

8. Given the $\tan \theta = \frac{-20}{21}$ without calculator, find the value of $\tan \frac{\theta}{2}$.

9. a. Find the truth set of $2^{2x+2} - 5(2^x) + 1 = 0$, $x \in \mathbb{R}$

b. Find the value of x if $8^{x-2} = 4^{3x}$

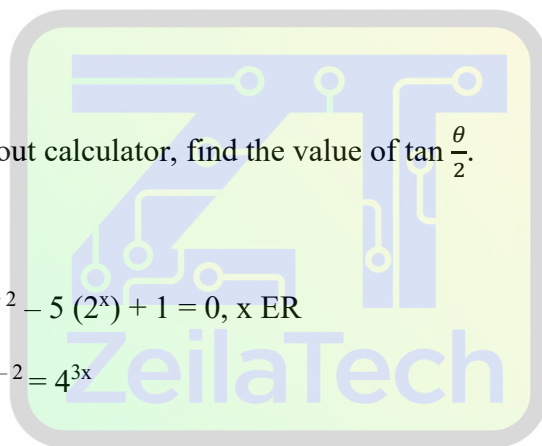
10. a. Solve $\log_{625} \left(\frac{1}{5} \right) - x = 0$

b. if $\log_{10} (5x + 2) - \log_{10} (x - 1) = 0.7782$ find x,

11. a. Given that $-6, -2\frac{1}{2}, 71$ is a linear sequence, calculate the number of terms in the sequence.

b. Express $0.1\dot{6}$ as an infinite geometric series.

12. Find the equation of the circle which passes through the point (1, 1), (2,4) and (3,2)



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