UNIVERSITI TEKNOLOGI MARA

MODELLING OF A SENSITIVE TYPE OF MYCOBACTERIUM TUBERCULOSIS USING REGRESSION MODEL ANALYSIS FOR NON-INVASIVE TECHNIQUE DETECTION

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

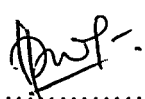**Faculty of Electrical Engineering**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results on my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

Tuberculosis disease has become an infectious disease and one of the leading causes of mortality and morbidity in the world. The conventional diagnosis and method used to detect the Mycobacterium Tuberculosis is time consuming, invasive, tiring, labor intensive and requires the microbiologist expertise to confirm the accuracy of the results. There is no electrical instrument to detect Tuberculosis automatically, no electronic circuit model for evaluating the instrument and no research has been carried out to model the sensitive type of Mycobacterium Tuberculosis. This project concerns with the development of an electronic circuit that models the sensitive type of Mycobacterium Tuberculosis. The aims of the research are to design and simulate circuit models that demonstrate the sensitive type of Mycobacterium Tuberculosis and to evaluate the performance of the model. In the model development, the collection rate of Mycobacterium Tuberculosis obtained from the previous studies was first converted to gain. Regression Model Analysis was carried out, followed by the design of the passive low pass filter, RC, LC and RLC circuits, circuits simulation and fabrication process. The best model of the sensitive type of Mycobacterium Tuberculosis is the second order of LC simulation circuit since it provides less than 10% discrepancy. From the simulation results, it was found that the logarithmic regression model is the best equation that demonstrates the sensitive type of Mycobacterium Tuberculosis.

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TABLE OF CONTENTS