

PRELIMINARY DESIGN OF A HEXAMINE PLANT WITH A CAPACITY OF 24000 TONNES PER YEAR

SKRIPSI

By:

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**CHEMICAL ENGINEERING DEPARTMENT
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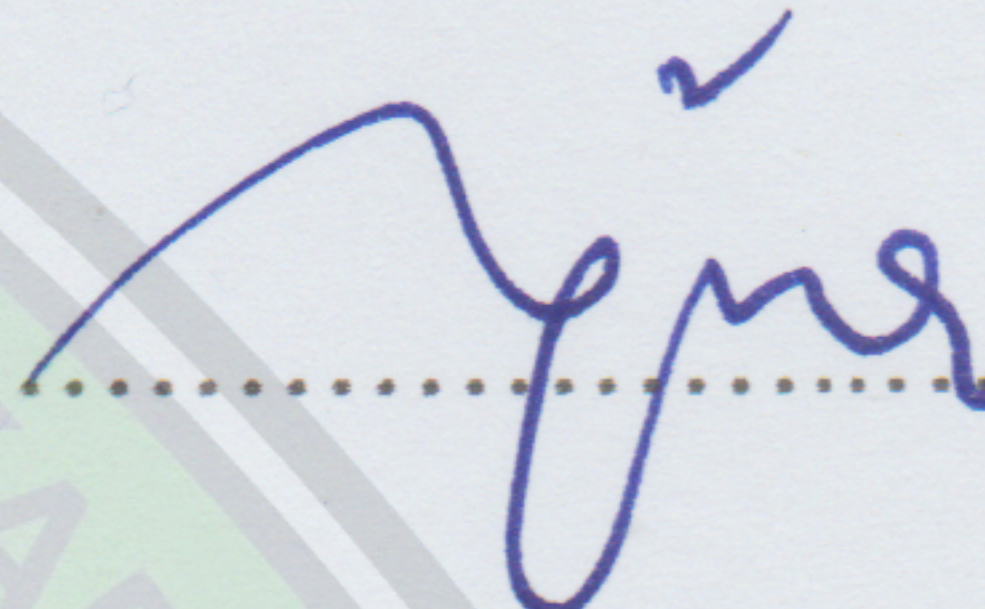
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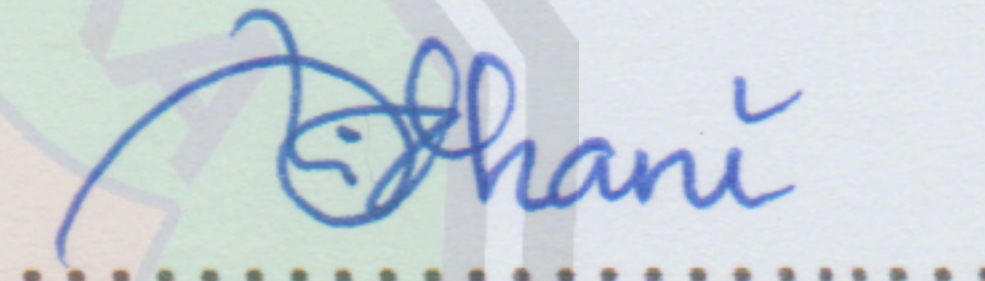
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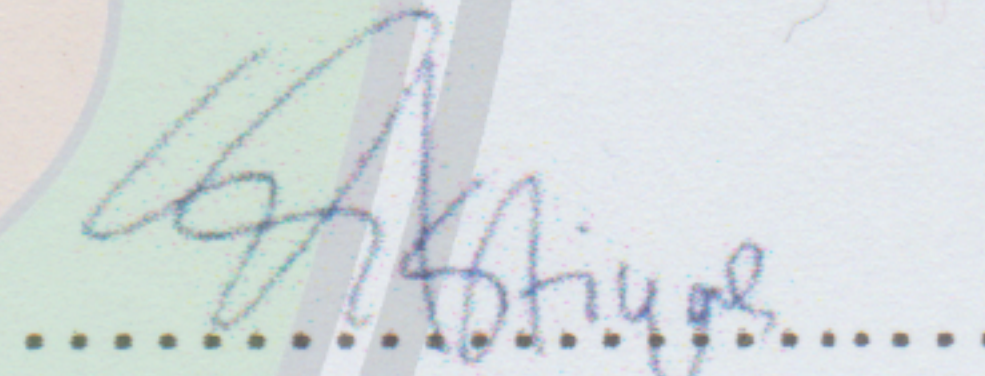
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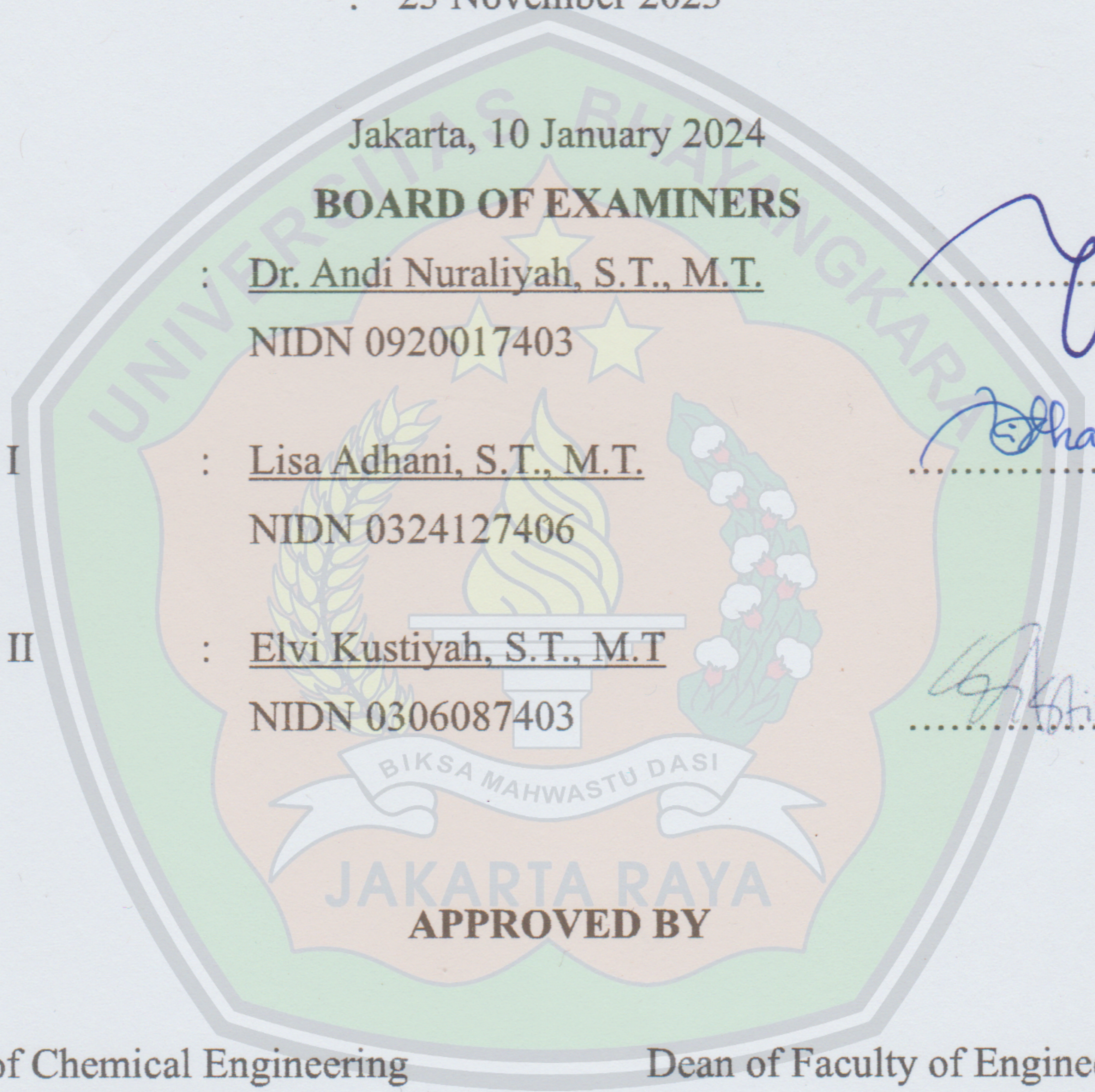
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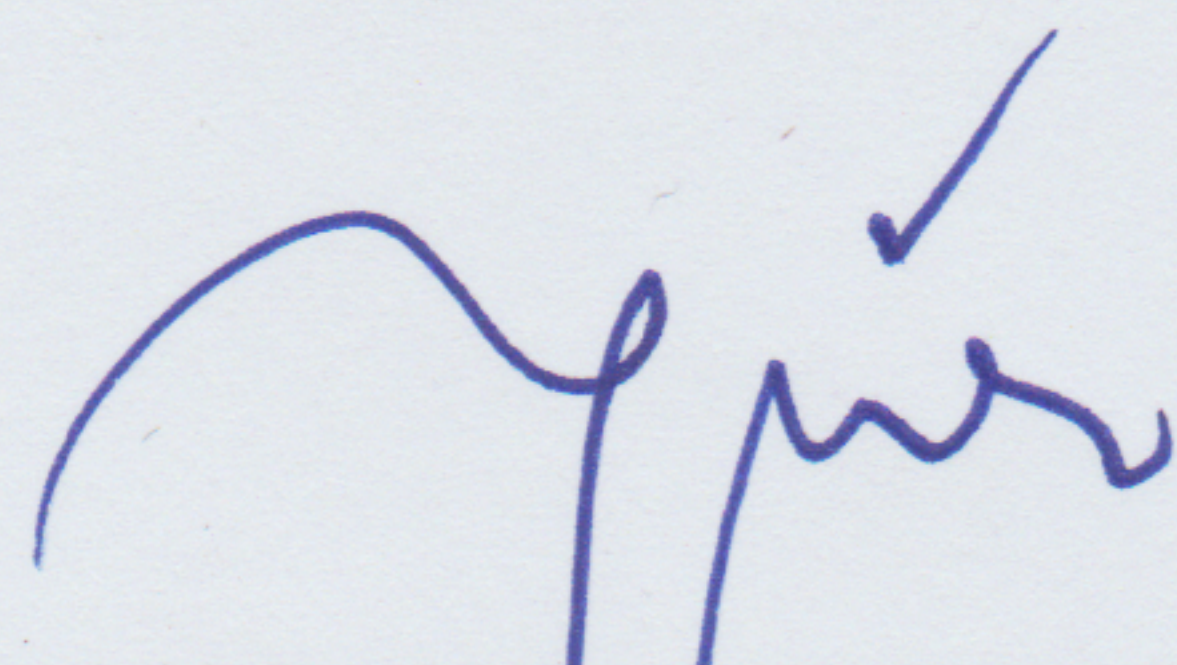
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ABSTRACT

Jessica Martha, 201910235019. Hexamethylenetetramine, often known as hexamine, is commonly used in quite a few industries, including fertilisers, resin, rubber, textiles, and agriculture. A hexamine manufacturing plant with an annual capacity of 24,000 metric tonnes has been designed to address both local demand and export. In Semarang, Central Java, a preliminary design for a hexamine production factory is being built. The Alexander F. Maclean method of producing hexamethylenetetramine includes the reaction of ammonia and formaldehyde. This reaction takes place in a CSTR (Continuous Stirred Tank Reactor). The operational conditions are kept constant at 1 atm of pressure and 40°C. According to the economic evaluation, the total capital investment is Rp629,624,575,353, and the total sales revenue is Rp256,831,375,197. Therefore, the post-tax profit is Rp166,940,393,878. According to the economic evaluation, the estimated plant is low-risk, with an ROI after tax of 27%, a pay-out time (POT) after tax of 3.54 years, a break-even point (BEP) of 41%, and a shut-down point (SDP) of 37%. After thorough analysis, it has been determined that the construction of a hexamethylenetetramine factory with a capacity of 24,000 metric tonnes per year is profitable.

Keywords: Ammonia, Formaldehyde, CSTR, Hexamine

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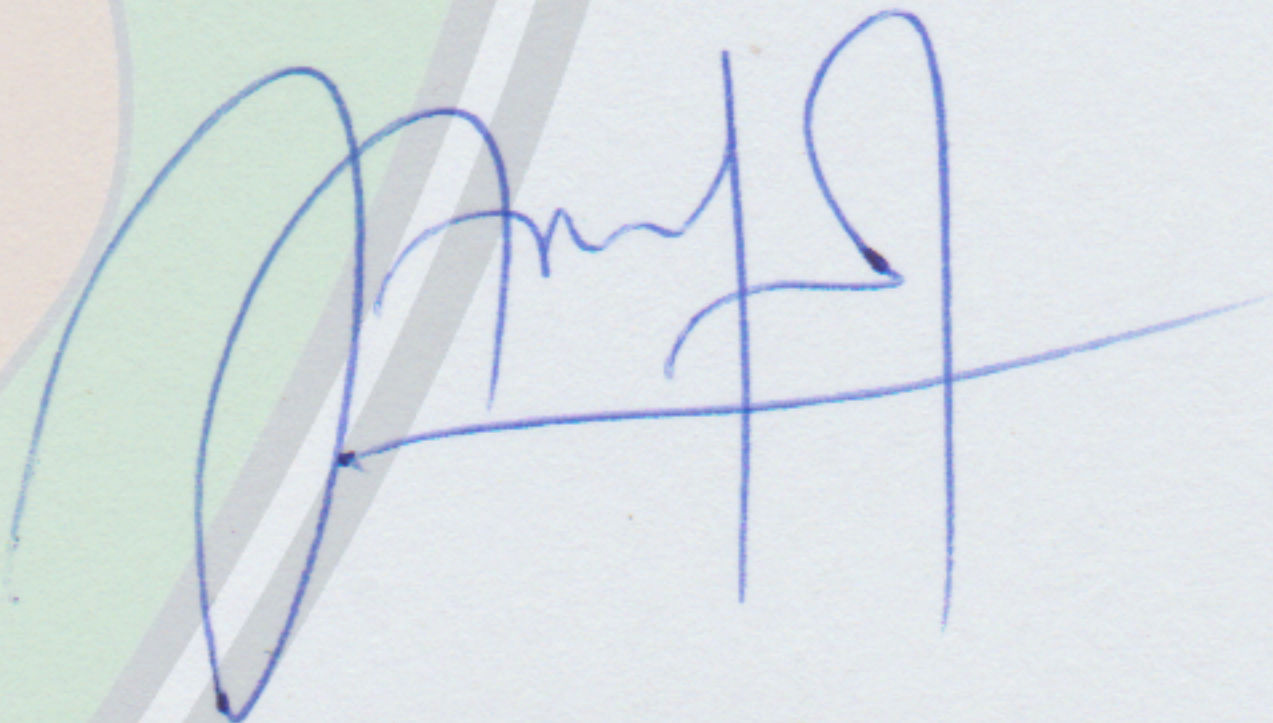
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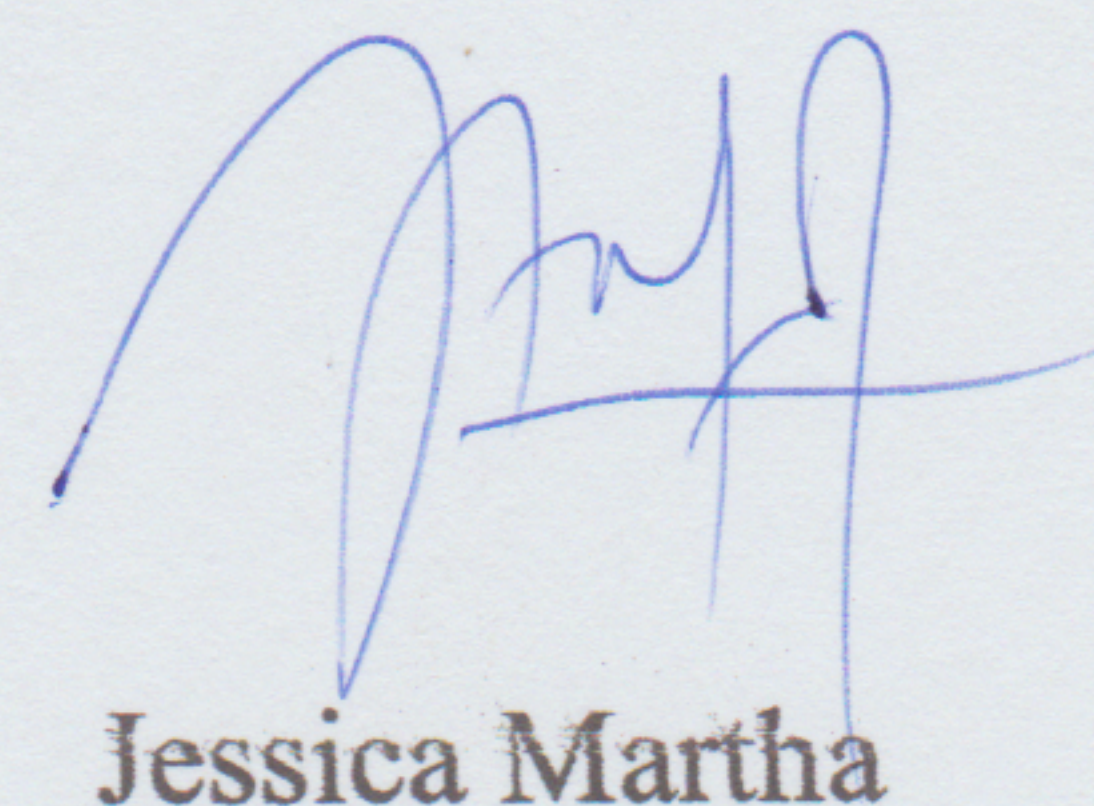

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