A MAJOR PROJECT REPORT ON

"PRODUCTION AND PERFORMANCE OPTIMIZATION OF COTTONSEED OIL BIODIESEL USING TAGUCHI ANALYSIS"

Submitted in partial fulfillment of the requirement

For the award of the degree of

MASTER OF TECHNOLOGY

(THERMAL ENGINEERING)

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CANDIDATE'S DECLARATION

I hereby declare that the work which is being presented in this dissertation entitled "**PRODUCTION AND PERFORMANCE OPTIMIZATION OF COTTONSEED OIL BIODIESEL USING TAGUCHI ANALYSIS"** in the partial fulfillment of the requirements for the award of the **degree of Master of Technology with specialization in Thermal Engineering**, submitted to the Department of Mechanical Engineering, Delhi Technological University, is an authentic record of my own work carried out under the supervision of **Dr. R. S. Mishra (**Professor) and **Dr. Amit Pal** (Assistant Professor) in the Department of Mechanical Engineering, Mechanical Engineering Department, Delhi technological university, Delhi.

The matter embodied in this dissertation has not been submitted by me for the award of any other degree.

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CERTIFICATE

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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ABSTRACT

A model is determined to analyzethe production of cottonseed oil biodiesel and emission of biodiesel in CI engine, Number of effective parameter and their right combinations are studied to minimize emission and maximize the yield of cotton seedbiodiesel. Taguchi-Anova approach has been utilized to determine optimum operation parameters using Minitab software. Linear graph theory L_9 (orthogonal array) has been utilized to determine experimental trial effective parameters that affects experimental part mostly. In order to determine maximum yield a signal to noise ratio method is applied which optimizes production and reduces number of experiments. In production we apply 'larger is better' condition because it maximizes yield for large production. But on emission side we apply 'minimum is better' condition because it minimizes the emission generated. From the results part its notice that when 1gm catalyst, 40 min time and 9:1 molar ratio is used maximum yield occur and after applying Anova technique it find out that the yield of cotton seed is mostly effect by molar ratio, time and catalyst respectively

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LIST OF ABBREVIATIONS

Anova	Analyses of varience
Avl-Dix	Avl smoke meter
B10	90% diesel+10% biodiesel
B20	80% diesel+20% biodiesel
B30	70% diesel+30 biodiesel
Cat	Catalyst 0
CO_2	Carbon dioxide
CO	Carbon monoxide
DOE	Design of experiment
FFA	Free fatty acid
HC	Hydrocarbons
L_9	9 Experiment
MS	Mean of square
O	Oxygen
NOx	Nitrogen oxide
PM	Particulates matter
SS	Sum of square
S/N	Signal to noise ratio
T	Time