A PROJECT REPORT ON

INFLUENCE OF SURFACTANT ADDDED NANO PARTICLE ADDITIVES (CeO2) WITH DIESEL-BIO DIESEL (COCUS NUCIFERA) BLEND ON DIRECT INJECTION COMPRESSION IGNITION ENGINE: COMBUSTION ENGINE PERFORMANCE ANDF EXHAUST EMISSION APPROACH

A project report submitted in partial fulfillment of the requirements for the award of the Degree of

BACHELOR OF TECHNOLOGY IN
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CERTIFICATE

This is to certify that the project entitled "**INFLUENCE OF SURFACTANT ADDDED NANO PARTICLE ADDITIVES (CeO2) WITH DIESEL-BIO DIESEL (COCUS NUCIFERA) BLEND ON DIRECT INJECTION COMPRESSIONIGNITION ENGINE: COMBUSTION ENGINE PERFORMANCE ANDF EXHAUST EMISSION APPROACH**" is the record of the work carried out by B.Saran (21815A0305), CH.Sai Manikanta (21815A0307),G.Veera Manikanta(21815A0314), A.Shanmukh (21815A0302), N.Manikanta (20811A0346) students of final year B.Tech in the department of Mechanical engineering. This work is done for the partial fulfillment for the award of BACHELOR OF TECHNOLOGY during the year 2022-2023.

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ABSTRACT

The present work is intended to improve the performance of a direct injection compression-ignition engine fueled with nanoparticle surfactant Flaxseed oilbiodiesel blend (B20). The Cerium oxide (CeO_2) nanoparticle additive with surfactant (C TAB) was mixed to B20 in concentrations of 50, 75, and 100 ppm. Tests were performed to assess the engine operating characteristics under varying load conditions such as 25, 50, 75, and 100% by maintaining a uniform speed of 1500 rpm. The combustion characteristics namely cylinderpressure (CP) and net heat release rate (NHRR) have greatly improved with the Cerium oxide (CeO_2) surfactant fuel than diesel-biodiesel blends. Besides,the brake thermal efficiency (BTE) has enhanced together with lower brake specific fuel consumption (BSFC). Finally, a significant decrease in emissions like carbon monoxide (CO), unburnt hydrocarbons (UHC), smoke,and nitrogen oxides (NO_{x}) were observed. At maximum load, the CP and NHRR have improved compared to normal diesel. The reduction in CO, UHC, NO_{x} and smoke were found for Cerium oxide (CeO_2) nanoparticlethan conventional diesel.