INTRODUCTION: 21st century has been facing many problems like energy sustainability, environmental problems and raising fuel prices. Conventional fuels are known for polluting air by emission for Sulphur dioxide, carbon dioxide, particulate matter and other gases. This has resulted in increased research in alternative fuels and renewable source of energy. Moreover, energy consumption of the world is ever increasing; this has caused the fuel sources to dwindle. The transport sector worldwide has considerably increased the fuel consumption reaching 61.5% of the total; especially in the last decade. Recent research expects that the amount of petrol in the world can be used merely for the next 46 years. Hence, interest in research for an effective substitute for petrol is increasing. Another important reason for alternative fuel development is the fact that a large percentage of crude oil must be imported from other countries for example gulf countries, which control the larger oil fields.

Fossil fuels are currently the dominant global source of CO2 emissions and their combustion is stronger threat to the environment. Increasing of the industrialization, energy demand, limited reserves of fossil fuels and increasing environmental pollution have jointly necessitating the exploring of some alternative to the conventional liquid fuels.

India imports the petroleum products at an annual cost of 50 billion USD in the year 2012-2013. Just by replacing 5% of petroleum fuel by bio fuel could enable India to save 2.5 billion USD. According to latest documents from April 2013-Feb 2014 got an import of 57335.97 million USD but from April 2014-Feb 2015 got an import of 53739.04 million USD. We come to know that the demand import of petroleum products decreased by 6.27%. Fossil fuels are the most developed energy source, but raise many doubts regarding issues related to environmental sustainability and economy.

Objectives
- To successfully produce neat bioethanol from cocoa pod waste.
- Optimization test has to be done on engine.
- Plot various graph of efficiency.
- To blend the neat bioethanol with regular petrol and obtain the blended fuel sample.
- To study the properties such as calorific value, viscosity, etc. of the blended fuel sample.
- To successfully arrive at a conclusion and put light on future possibilities and scope in this particular sector.

METHODOLOGY
Material Required: Cocoa pod, Demineralized water, Sodium Hydroxide pellets, Sulphuric acid, Baker Yeast
Apparatus Required: Thermometer, Heater, Funnels, Standard Flask, Glass rod.
Production of Bioethanol: The production of bioethanol was carried out in
Stage 1: Collecting of cocoa pod
Stage 2: Milling of Cocoa pod
Stage 3: Fermentation
Stage 4: Distillation

Collecting of Cocoa pod: The Cocoa pod is initially collected from farmer field in Hosanagar, Shivamoga district. That pod contains water content, so it can be dried by Sunlight and make that pods into pieces like 1cm size for easy drying process.
**Milling or Powdering of Cocoa pod:** The above Cocoa pod can powder with the help of mixer, and it can powder in fine form that can be used for bioethanol production process. The powder is fully dried.

**Soaking in Sulphuric acid and hydrolysis of sample:** For the sample 150ml of NaOH is mixed and heated up for 30 minutes and cool it down for room temperature and 150 ml of dilute sulphuric acid is mixed and again heated up to 90 minutes. Afterwards, the sample were placed in the autoclave for hydrolysis. Acid hydrolysis was done due to its economic important.

**Fermentation Process:** Chemical process by which molecules such as glucose are broken down anaerobically. More broadly, fermentation is the foaming that occurs during the manufacture of wine and beer, a process at least 10,000 years old. The frothing results from the evolution of carbon dioxide gas, though this was not recognized until the 17th century. French chemist and microbiologist Louis Pasteur in the 19th century used the term *fermentation* in a narrow sense to describe the changes brought about by yeasts and other microorganisms growing in the absence of air (anaerobically); he also recognized that ethyl alcohol and carbon dioxide are not the only products of fermentation. Fermentation of sample was done at a room temperature. The fermentation can be done by adding baker yeast in the sample. The yeast can be added in a proper concentration 1.2 gm respectively. The sample were placed at a 30°C for the fermentation for about 92 hours.

**Distillation Process:** After fermentation, the sample were ready for the distillation. The distillation was done in the distillation assembly for about 8 hours. The distillation can be held twice in order to optimize the production of bioethanol in the final product. By this distillation process, we got the final sample bioethanol from the cocoa pod.

**CONCLUSION**

Alternative fuels for SI engine have become increasingly important due to diminishing petroleum reserves and awareness of the increased environmental problems. The use of "renewable fuels" may be the key to overcome these problems. The objective of the present work was to analyze the suitability of blend of Bioethanol-petrol as an alternative SI engine fuel. The most important advantage of this bioethanol is that it is a renewable. The engine performance test was carried out on SI engine using blend of 10% ethanol-90% petrol and 25% ethanol-75% petrol while pure petrol was used as a reference fuel. The experimental results show that engine performance with blend was found to be slightly poorer in comparison with reference fuel. From the present experimental study of alternative engine fuel, it can be concluded that a SI engine can be successfully operated with blends of bioethanol-petrol without any major engine modification and operational difficulty. Conclusion can be drawn based on the SI engine performance and emission characteristics of bioethanol-petrol blends and petrol in a multi-cylinder spark ignition engine without any modification in the engine at various engine speeds. The result may conclude as:

- The use of ethanol as a fuel additive to gasoline causes improvement in engine performance and exhaust emissions.
- Since ethanol has lower calorific value so the brake specific fuel consumption of the ethanol-gasoline blends are found to be higher than gasoline.
- Brake thermal efficiency of the ethanol-gasoline blends is found to be higher in comparison to gasoline.
- Due to oxygen contain by ethanol-gasoline blends, the exhaust gas temperature of the blends are found to be lower in comparison to gasoline.

From the results, it can be concluded that ethanol blends are quite successful in replacing pure petrol in Spark Ignition Engine. Results clearly show that there is an increase in Specific Fuel Consumption because of low calorific Value of ethanol than petrol and also increase in the mechanical efficiency and Brake thermal efficiency. So from the curves, it is seen that 10% and 25% ethanol blended petrol is the best choice for use in the existing Spark Ignition Engines without any modification to increase efficiency. A little consideration has to be taken on material used as maximum pressure inside cylinder is increased by blending.