INTRODUCTION:
Biogas is a gaseous fuel generated from biological decomposition of organic waste such as cattle dung and biological wastes. Biogas is a mixture of methane (a high calorific fuel) and Carbon-dioxide. It also contains traces of other gases such as Hydrogen sulphide. Biogas is highly combustible and is used as a fuel. This gas can replace wood, kerosene, Liquefied Petroleum Gas (LPG), petrol and diesel. The calorific value of gas varies between 4500 -5500 Kcal / cubic metre (cub-m). The slurry of biogas plant can be used as organic fertilizer. The most common feed material in a family size biogas plant is cattle dung. Biogas can be used in a Biogas Chula/ burner for cooking. A biogas plant of 2cub-m capacity is sufficient for providing cooking fuel to a family of 4 persons. Biogas can be also used for lighting a biogas lamp. The requirement of gas for powering a 100 candle lamp (60 W) is 0.13 cub-m per hour. The biogas contains 35% carbon dioxide, 58% methane, 5% nitrogen, 1% hydrogen sulphide and 1% hydrogen. In present day petrol and diesel are the major fuel used in the vehicles, but these fuels are depleting in nature. As methane is very hard to compress so it is best use as for stationary fuel, rather than mobile fuel. It takes a lot of energy to compress the gas (this energy is usually just wasted) and this high pressure is hazardous. A variable volume storage (flexible bag or floating drum are the two main variants) is much easier and cheaper to arrange than high pressure cylinders, regulators and compressors. Biogas is one of the good renewable energy source and it is possible to convert methane gas present in the biogas to liquid fuel as methanol and can be used in vehicles

Objective:
- To convert the methane gas into methanol.
- To analyse the performance of methanol in IC engine.
- Application of renewable energy resources.
- Reduction in pollution level in atmosphere.
- Energy from waste materials.
- Autonomy in fuel sector.

Methodology:
The schematic diagram of the experimental setup is shown in the fig.3.1. It consists of biogas digester unit with continues supply of biogas, three beakers with KOH solution to purify the methane gas present in the biogas, two round bottom flask for further reaction process and one heater coil to maintain constant temperature throughout the experiment for the round bottom flask which contains solution of bromine and carbon.
tetrachloride.

Component specifications
1, 2, 3 – Beakers .4, 5 – Round bottom flasks

Conversion process
1. Preparation of solution
2. Separation of methane from bio gas
3. Conversion of Methyl Bromide to methanol
4. Condensation process.

Chemical reactions
Methane gas is treated with acetic acid to get below by product with CH3Br and treating with KOH to produce methanol.

1) CH4 CH3COOH/Br2 CHBr3 + CH2Br2 + CBr4 + CH3Br(GAS) + HBr
2) CH3Br(GAS) + KOH(AQUEOUS) CH3OH(METHANOL) + KBr
CH3Br (LIQUID) – Tribromomethane, CH2Br2 (LIQUID) - Dibromomethane.
CBr4 (LIQUID) - Carbon teta bromide, CH3Br (GAS) – Methyl bromide
HBr (GAS)-Hydrogen bromide.

Results and Conclusion:
Bio-gas is a renewable energy source and is also a green fuel. It can be generated in large quantity to meet our future energy demand. Here we have adopted a methodology of converting biogas into liquid fuel methanol, so that it can be used as a fuel for automobiles.
The concept of blending methanol with petrol for SI engine has been implemented successfully for a 7.35 kW, 4 stroke SI engine. Performance test of the engine was tested for this engine under different blending proportion. Test was conducted under no load and loading condition, maintaining the constant speed of hydraulic dynamometer at a value of 1500 rpm throughout the test and engine developed a maximum power of 7.35kW. The comparative test result obtained from graph indicate a slight improvement in performance, when the engine is working with methanol Blended Petrol.
Emission test also shows that very less amount of greenhouse gases are release when M30 fuel is used in the SI engine.

Scope for Future Work:
Methanol reduces emissions, which has a significant effect on bettering the environment. Methanol blended with gasoline significantly increases the performance of the automobile.Bio-gas is a renewable energy source and is also a green fuel. It can be generated in large quantity to meet our future energy demand. Here we have adopted a methodology of converting biogas into liquid fuel methanol, so that it can be used as a fuel for automobiles field.