List of Tables

Table No.	Title	Page
1.1	Prediction of world renewable energy use by type [4].	4
1.2	Shows the different types of catalyst for removing the impurities present in the producer gas.	14
2.1	Parts name of gasifier system.	37
2.2	Technical specifications and salient features of URJA biomass downdraft gasifier system [Model URJA 10 PGD].	40
2.3	Fuel consumption and time taken with increasing load when only diesel is used as fuel.	49
2.4	Fuel consumption and time taken with the increasing load when a mixture of diesel and producer gas is used as a fuel. Feedstock- Wood.	50
2.5	Fuel consumption and time taken with the increasing load when a mixture of diesel and producer gas is used as a fuel. Feedstock- Wood + 10 wt.% calcium oxide.	51
2.6	Fuel consumption and time taken with the increasing load when a mixture of diesel and producer gas is used as a fuel. Feedstock- Coconut shell.	52

2.7	Fuel consumption and time taken with the increasing load when a mixture of diesel and producer gas is used as a fuel. Feedstock- Coconut shell + 10 wt.% calcium oxide.	53
2.8	Fuel consumption for both diesel and mixture of diesel and producer gas with different load.	54
2.9	Percentage reduction in diesel consumption with respect to load. Feedstock- Wood, Wood with calcium oxide.	62
2.10	Percentage reduction in diesel consumption with respect to load. Feedstock- Coconut shell, Coconut shell with calcium oxide.	63
2.11	Calculation of money spend on 1unit energy generation. Feedstock -Wood, Wood + 10 wt. % *CaO*.	65
2.12	Calculation of money spend on 1unit energy generation. Feedstock: Coconut shells, Coconut shells + 10 wt. % *CaO*.	66
2.13	Classification of tar compounds [7].	71
2.14	Uncertainty analysis for different feed stokes at different load conditions.	78
3.1	Efficiency of different technologies for removal of particles [3].	83
3.2	Input parameters of cyclone separator.	89
3.3	Particle size efficiency for different feedstocks. (Experimental).	93
3.4	Particle size efficiency for different feedstocks. (Empirically using Leith and Licht model).	99
3.5	Experimental conditions and output parameters.	113

3.6	Calculation for initial reading of viscosity of SBME (biodiesel).	118
3.7	Viscosity measured for different storage time of SBME (biodiesel).	119
3.8	Determination of calorific value of fresh Soyabean methyl ester (biodiesel).	121
3.9	Calorific value of pure biodiesel at varying storage time interval.	121
3.10	Emissions at various loads and compression ratios for B10 blend of SBME (biodiesel) with diesel oil.	123
3.11	Emissions at various loads and compression ratios for B20 blend of SBME (biodiesel) with diesel oil.	124
3.12	Emissions at various loads and compression ratios for B30 blend of SBME (biodiesel) with diesel oil.	125
3.13	Density and calorific values of different biodiesel blends.	126
4.1	Various correlations for *Eu* variation in perforated plates as a function of porosity and other parameters.	144
4.2	Details of meshing of perforated plates with different hole geometry.	152
4.3	Shows; Reynolds number, Velocity, Experimental Euler number, *CFD* Euler number, % error, Number of holes and Porosity *(β).*	156
4.4	Correlations for Euler number variation with number of filters *N*. Porosity $\beta = 0.235$, $Re = 29110$ are kept constant for all the cases.	169

B.1 Calculation of discretization error 197