APPENDICES

APPENDIX I

The weights and biases of the ANN models for predicting the different gas components of fixed bed downdraft gasifiers are shown below.

Weights and biases of the ANN model for predicting the CH_4 component

CH_4

$IW_{j,i}$ (Weight to j^{th} neuron of hidden layer from i^{th} input variable)

Neuron Number (j) <<<< / Input Variable >>>>						
	-17.6027	17.2542	-2.3069	-3.1062	-6.4648	4.1790
	-7.3800	-6.0896	2.7296	9.0988	0.1463	-5.8396
	-2.1373	-3.2973	-2.3466	-4.3181	-11.0760	-11.1414
	5.1071	8.3481	2.0617	-2.9964	3.6625	25.5160
	-13.0804	-5.2580	4.1597	14.8558	-2.3186	-5.2698

$LW_{i,j}$ (Weight to output layer from j^{th} neuron of hidden layer)

0.6780	2.7211	2.3511	-0.7188	-3.1098	

$b1_j$ (Bias to j^{th} neuron of hidden layer)

-14.9758
5.4333
7.3736
2.0769
3.9161

b_2 (Bias to output layer)

-3.0962

Weights and biases of the ANN model for predicting the CO component

CO

$IW_{j,i}$ (Weight to j^{th} neuron of hidden layer from i^{th} input variable)

Neuron Number (j) <<<< / Input Variable >>>>						
	-0.4364	-2.6874	-1.2367	-0.2085	-0.0112	2.7939
	1.6237	-0.1854	-1.1010	-1.0626	0.7254	-0.3726
	0.5719	1.5379	-0.8304	-0.5450	0.0289	3.1442
	2.7569	1.7178	-0.4123	0.0756	0.9075	1.2324
	0.9000	0.5645	-0.0592	2.1174	1.5968	-2.3453

$LW_{i,j}$ (Weight to output layer from j^{th} neuron of hidden layer)

-2.1202	-0.7772	-1.8259	2.1282	-2.0266	

$b1_j$ (Bias to j^{th} neuron of hidden layer)

1.9201
-0.14213
0.4524
1.4228
1.5034

b_2 (Bias to output layer)

0.78426

Weights and biases of the ANN model for predicting the CO_2 component						
CO_2						
$IW_{j,i}$ (Weight to jth neuron of hidden layer from ith input variable)						
Neuron Number (j) <<<<	**Input Variable >>>>**					
	2.1725	2.6782	-3.5350	-1.6459	-0.5401	4.0581
	0.3007	0.0159	0.2462	0.5012	0.7507	1.9872
	-2.0216	0.8526	-1.8596	1.2226	2.5651	1.8108
	-4.2785	-1.2942	0.2411	0.8927	2.1661	-1.8877
$LW_{i,j}$ (Weight to output layer from jth neuron of hidden layer)						
0.99	-0.55832	0.45439	2.7099			
$b1_j$ (Bias to jth neuron of hidden layer)						
-3.4931						
-3.2483						
0.77562						
-4.3819						
b_2 (Bias to output layer)						
2.3498						

Weights and biases of the ANN model for predicting the H_2 component						
H_2						
$IW_{j,i}$ (Weight to jth neuron of hidden layer from ith input variable)						
Neuron Number (j) <<<<	**Input Variable >>>>**					
	0.59987	1.2142	1.8458	-0.50212	-0.22205	-2.5718
	2.5778	-0.32723	0.44952	-2.3254	0.85187	-0.51569
	0.037595	-1.6371	3.6629	0.5319	2.8321	0.58103
$LW_{i,j}$ (Weight to output layer from jth neuron of hidden layer)						
2.1085	0.11924	-0.58747				
$b1_j$ (Bias to jth neuron of hidden layer)						
-3.6986						
1.409						
2.1341						
b_2 (Bias to output layer)						
1.5765						