Q1. Define the following with simple example (choose five only):

(1) Ambiguity       (2) three-address code       (3) Compiler
(4) Operator grammar (5) handle                 (6) Conflicts

Q.2) briefly answer the following (choose three only)

A) Draw the diagram showing the position of parser in compiler model.
B) What is the differences between static and dynamic semantic?
C) Explain the three techniques of loop optimization with simple examples.
D) List the four error routines in the bottom-up parsing table, and what is the suitable solution for each type.

Q.3) Consider the following grammar G.

\[ E \rightarrow E + T \mid T \]
\[ T \rightarrow \text{id} \mid \text{id}(\text{ }) \mid \text{id}(L) \]
\[ L \rightarrow E \mid L \mid E \]

1. Eliminate left recursion:
2. Eliminate left factoring.
3. Prove that your grammar is LL(1) by whatever method you like.

Q.4) Consider the following grammar:

\[ E \rightarrow E \ a \ b \ F \mid T \]
\[ T \rightarrow T \ b \ a \mid F \]
\[ F \rightarrow \text{a} \mid \text{b} \mid [E] \]

Parse the string "abaaba" by using predictive parsing method.
Q.5) Given the following grammar:

(1) \[ S \rightarrow A \]
(2) \[ S \rightarrow B \]
(3) \[ A \rightarrow a \ A \ b \]
(4) \[ A \rightarrow 0 \]
(5) \[ B \rightarrow a \ B \ b \ b \]
(6) \[ B \rightarrow 1 \]

The terminals are \( \{a, b, 0, 1\} \), and the nonterminals are \( \{S, A, B\} \). Parse the sentence "aa1bbb" using SLR parsing method.

(10 marks)

Q.6) A: Write the triple and quadruple form for the following statement:

\[ A[j] = B + (c + d) * X[i] - Y/Z \]

B: Show a successful bottom up parse (stack) of input "bca" using the parsing table below:

\[ S \rightarrow AaB | B \]
\[ A \rightarrow bB | c \]
\[ B \rightarrow A \]

<table>
<thead>
<tr>
<th>STATE</th>
<th>action</th>
<th>goto</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>s4 s5</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>s6 r5</td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>s4 s5</td>
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<td>r4</td>
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</tr>
<tr>
<td>5</td>
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<tr>
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<td>r4</td>
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<tr>
<td>7</td>
<td>r3</td>
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</tr>
<tr>
<td>8</td>
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</tr>
<tr>
<td>9</td>
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</table>

(10 marks)

GOOD LUCK