

## Written Assignment - I

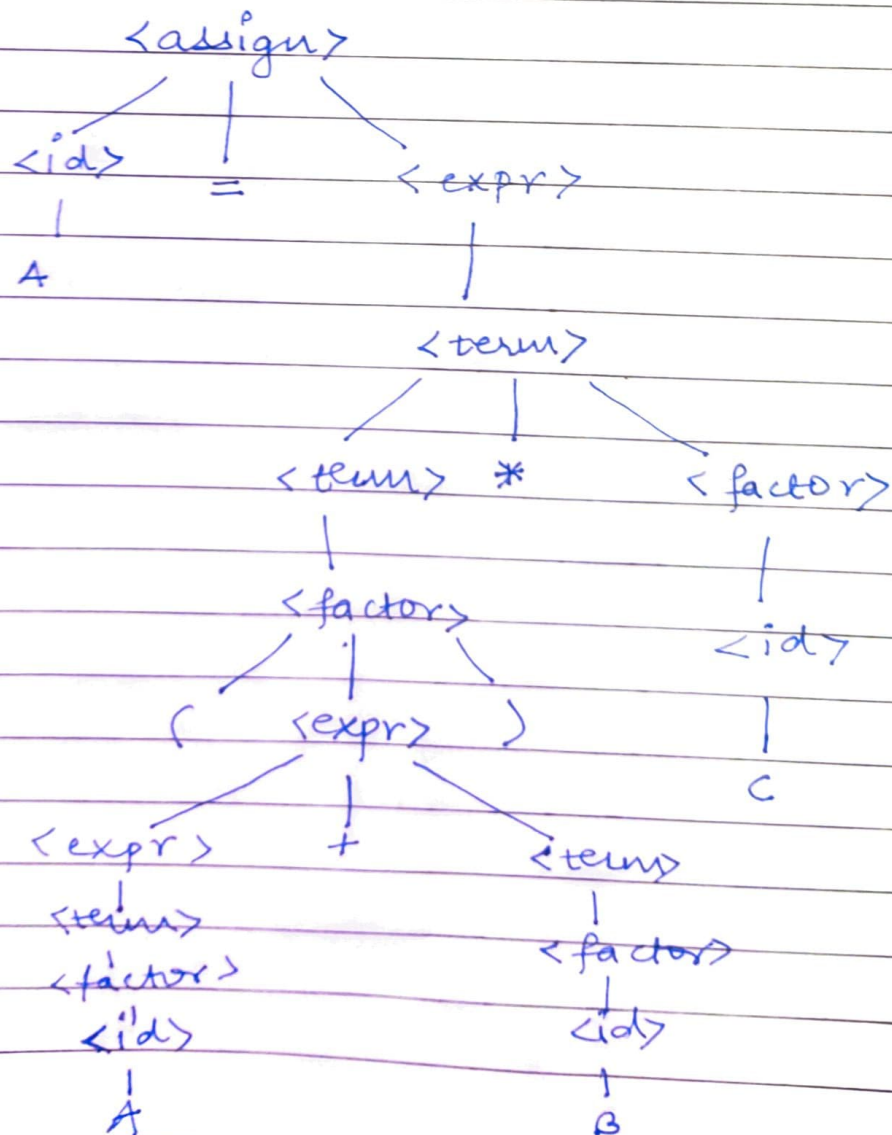
### CS202

Q1

i)  $\langle \text{assign} \rangle \rightarrow \langle \text{id} \rangle = \langle \text{expr} \rangle$   
 $\langle \text{id} \rangle \rightarrow A/B/C$   
 $\langle \text{expr} \rangle \rightarrow \langle \text{expr} \rangle * \langle \text{term} \rangle$   
 $\quad \quad \quad | \langle \text{term} \rangle$

$\langle \text{term} \rangle \rightarrow \langle \text{factor} \rangle + \langle \text{term} \rangle \mid \langle \text{factor} \rangle$   
 $\langle \text{factor} \rangle \rightarrow (\langle \text{expr} \rangle) \mid \langle \text{id} \rangle$

ii) a) Parse tree



b) left most derivation

$\langle \text{assign} \rangle \rightarrow \langle \text{id} \rangle = \langle \text{expr} \rangle$

$\Rightarrow A = \langle \text{expr} \rangle$

$\Rightarrow A = \langle \text{term} \rangle$

$\Rightarrow A = \langle \text{term} \rangle * \langle \text{factor} \rangle$

$\Rightarrow A = \langle \text{factor} \rangle * \langle \text{factor} \rangle$

$\Rightarrow A = (\langle \text{expr} \rangle) * \langle \text{factor} \rangle$

$\Rightarrow A = (\langle \text{expr} \rangle + \langle \text{term} \rangle) * \langle \text{factor} \rangle$

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$\Rightarrow A = (\langle \text{factor} \rangle + \langle \text{term} \rangle) * \langle \text{factor} \rangle$

$\Rightarrow A = (\langle \text{id} \rangle + \langle \text{term} \rangle) * \langle \text{factor} \rangle$

$\Rightarrow A = (A + \langle \text{term} \rangle) * \langle \text{factor} \rangle$

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$\Rightarrow A = (A + \langle \text{id} \rangle) * \langle \text{factor} \rangle$

$\Rightarrow A = (A + B) * \langle \text{factor} \rangle$

$\Rightarrow A = (A + B) * \langle \text{id} \rangle$

$\Rightarrow A = (A + B) * C$

Q2

i) switch statement in C

```
<switch> → switch '(' <expr> ')' '{'
           { case <case-literal> : { <stmt> } }
           [ default : { <stmt> } ]
           '}'
```

ii) Java class header statement

```
<header> → [public] [(final | abstract)] class
           <class-id> [extends <class-id>]
           [implements <class-id> { , <class-id> }]
```