United College of Engineering & Research, Allahabad

Second Sessional (2016-17)

Compiler Design (NCS-603)

B.Tech VIth Sem(CS+IT)

Time : 120 Min. M.M. 30

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[Section –A] [Attempt all part] [1X10=10]

1. What are the Synthesized and Inherited Attributes?
2. Differentiate between Annoted parse tree and Syntax tree.
3. Find the follow of all non terminals in the given grammar

   P->S#
   S->ABC
   A->a | bbD
   B->a | ϵ
   C->b | ϵ
   D->c | ϵ
4. What is activation record?
5. How is scope information represented in symbol table?
6. Explain the term token, lexeme, and pattern.
7. Differentiate between Quadruple and Triples.
8. Discuss the challenges in compiler design?
9. What is bootstrapping?
10. What is the maximum number of reduce moves that can be taken by a bottom-up parser for a grammar with no epsilon- and unit-production (i.e., of type A -> ϵ and A -> a) to parse a string with n length? Explain with example.

[Section –B] [Attempt any 3 part] [4X3=12]

1. Discuss the various data structure used for symbol table with suitable example.
2. Generate three address code for the following code.

```
Switch a+b
{
        case 1: x=x+1;
        case 2: y=y+2;
        case 3: z=z+3;
        default: c=c-1;
}
```

3. What are the lexical phase error, syntactic phase error and semantic phase errors? Explain with suitable example.

4. Show that the following grammar
   S->Aa | bAc | Bc | bBa
   A->d
   B->d
   is LR(1) but not LALR(1)
5. Construct a DFA which accepts set of all strings over {a,b} which starts and ends with different symbol.

[Section –C] [Attempt any 1 part] [8X1=8]

1. Define syntax directed translation. Construct an annoted parse tree for the expression (4*7+1)*2, using simple desk calculator grammar and also show the implementation of SDT rule.
2. Define backpatching and sementic rules for Boolean expression. Derive the three address code for the following expression
   P<Q and R<S and T<U
3. (a) Construct the CLR parse table for the following grammar
   S->CC
   C->cC
   C->d
   (b) Show that the following RE's are same by constructing optimized DFA's
   I. $(a \mid b)^*$
   II. $(a^* \mid b^*)^*$
   III. $(a \mid b^*)^*$