United College of Engineering & Research,Allahabad

First Sessional (2017-18)

Compiler Design(NCS-603)

CS/IT 6th Semester

Time : 120 Min. MM. 30

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[Section –A] **[Attempt all parts]** **[1X10=10]**

1. What is cross compiler?
2. Differentiate between Compiler and Interpreter?
3. Explain the term bootstrapping with example.
4. Draw the transition diagram for relational operator?
5. Find the no of Lexeme in given code fragment
   printf("what's up %d",++&&***a); // abc
6. Discuss the merit and demerit of single pass compiler and multi-pass compiler?
7. Differentiate between linker and loader?
8. Describe the language denoted by the following regular expression: $(1+0)^*$
9. Explain the term token, pattern and lexeme.
10. Write the lex program to recognize the valid identifiers.

[Section –B] **[Attempt any five parts]** **[5X2=10]**

1. (i)Remove left recursion from the grammar

   E ->E(T)/T

   T->T(F)/F

   F->id

   (ii)Apply the left factoring in the following grammar.

   S->bSSaaS / bSSaSb / bSb / a
2. Construct minimum state DFA for the following regular expression:

   (a|b)* a (a|b)
3. Construct a minimal DFA which accept set of all strings over {a,b} in which every 'a' should be followed by 'bb'
4. Discuss input buffering and preliminary scanning in lexical analysis.
5. What is mean by ambiguous grammar? How ambiguity is avoided? Explain with suitable example.
6. Explain recursive decent parser. Create the parser for the following the following grammar

   E-> iE'

   $E' \rightarrow +iE'|\epsilon$

[Section –C] **[Attempt any Two parts]** **[5X2=10]**

1. Consider the following grammar

   $E\text{->}TE'$

   $E'\text{->}+E|\epsilon$

   $T\text{->}FT'$

   $T' \rightarrow T|\epsilon$

   $F \rightarrow PF'$

   $F' \rightarrow * F'|\epsilon$

   $P \rightarrow (E)|a|b|\epsilon$

   Construct predictive parsing table for above grammar.

2. Explain the phases of the compiler in detail. Write down the output of each phase for the expression a=b*c + 50.

3. Parse the string **id+id*id** with the grammar given below by using LL(1) parsing techniques.

$$E \rightarrow TE'$$
$$E' \rightarrow +TE'|\epsilon$$
$$T \rightarrow FT'$$
$$T' \rightarrow * FT'|\epsilon$$
$$F \rightarrow id|(E)$$

Show every step in detail.