Indian Institute of Information Technology Sri City, Chittoor

End Exam: Compilers Date: 04-12-2020
Duration: 1.5 Hour Time: 9.00 PM - 10.30 PM

Instructions:

- All questions are mandatory.

1) Answer the following questions(if there are multiple answers please write all) 1*6=6
   a) The number of tokens present in the following statement is:

```
printf("i = %d, &i = %x", i, &i);
```

      i) 10
      ii) 3
      iii) 23
      iv) 21

   b) E → E * F /F-G
      F → F+G/G
      G → G^H/id
      H → id1
      For the above Grammar
      i) - have higher precedence than *
      ii) + have higher precedence than *
      iii) ^ have higher precedence than *
      iv) None of the above

   c) Match all items in Group 1 with correct options from those given in Group 2.

Group 1	Group 2
A. Regular expression	1. Code optimization
B. Pushdown automata	2. Code generation
C. Dataflow analysis	3. Lexical analysis
D. Register allocation	4. Syntax analysis

      i) A-3, B-1, C-4, D-2
      ii) A-4. B-1, C-2, D-3
      iii) A-2, B-1, C-4, D-3
      iv) A-3, B-4, C-1, D-2

   d) Which of the following parser is/are most powerful
      i) CLR
      ii) SLR
      iii) LL(1)
      iv) LALR

   e) The following grammar is SLR

      S → aAbBCf
      A → dBfg
      B → Cg | k

C → m | t

i) The above statement is true
ii) The above statement is false
iii) The above statement is neither false nor true
iv) None of the above

f) In compiler FSA is used in
i) Lexical analysis
ii) Code generation
iii) Parser
iv) Code optimization

2) Write Lex & YACC rules for the following grammar to calculates values 4

S → m*X
X → A+X
A → T-V | Q+V
X → g+T
T → i
Q → -u

3) For the following grammar write the semantic rules and show the step by step translation fow string w=m*i-V+g+i 2+2

S → m*X
X → A+X
A → T-V | Q+V
X → g+T
T → i
Q → -u

4) Perform quadruple and triple for the following expression 1.5

x = (a+b)*(-c+a+b)+d

5) Calculate the FOLLOW of the following grammar 3

enum -> enum alpha | token
alpha -> op enum | op1
token -> (enum) | Alpha

6) Generate code for the following three-address statements assuming all variables are stored in memory locations. 2.5

- x = 100
- x = a
- x = a + 10
- x = a - b
- The two statements
  - x = b * c
  - y = a / x