Reg. No.



INTERNATIONAL CENTRE FOR APPLIED SCIENCES (Manipal University) IV SEMESTER B.S. DEGREE EXAMINATION – NOV./DEC.2016 SUBJECT: LANGUAGE PROCESSORS (CS 244) (BRANCH: COMPUTER SCIENCE) Tuesday, 22 November 2016

Time: 3	Hours
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Max. Marks: 100

✓ Answer ANY FIVE Questions.

A) Show the output of each phase of compilation for the input "SI= (p*t*r)/100"
B) Explain any five compiler construction tools.
C) Define Regular Definition. Write regular definition which accepts unsigned numbers of the form : 1.23, 1234, 1, 123E2, 12E-4, 34E+2, 0.14, 1.2E+4, 1.1E-5, 1.2E3. Also draw transition diagram for same.

(7+5+8)

2. A) How are reserved words handled by Lexical Analyzer?

B) Construct a DFA from the regular expression "letter(letter|digit)* " using McNaugton-Yamada-Thomson algorithm and subset construction method C) Consider the Following CFG

Var_decl \rightarrow var Decl_list Decl_list \rightarrow Decl ; Decl_list | Decl Decl \rightarrow Id_list : id Id list \rightarrow Id list , id | id

Eliminate left-recursion from the grammar and left-factor it and give the final grammar after these changes.

(5+10+5)

3. A) Consider the following grammar

$$S \rightarrow ABC$$

A→ aA | bbD

- $B \rightarrow a \mid \epsilon$
- $C \rightarrow bC \mid \epsilon$
- $D \rightarrow cD \mid \epsilon$
- a. Compute the First and Follow sets and tabulate the same.
- b. Build the LL (1) Parsing Table.
- c. Show the predictive parsing actions for the input string "abbcabc" using the table obtained in Q 3A.b. Also mention whether the input string belongs to above grammar or not with suitable reason for the same.

B) What is Shift-Reduce parsing? Define the four possible actions a Shift-Reduce parser can make.

C) Explain the Action and Goto functions involved in LR Parsing table in detail.

(10+5+5)

4. A) Consider the grammar

A'**→**A

 $A \rightarrow (A) \mid a$

For the above grammar

- a) Construct LR (1) item set.
- b) For the DFA obtained above construct LALR automaton.

B) Explain the error recovery strategies adopted by parser with an example for each.

(10+10)

5. A) What is attribute grammar? Explain the types of semantic attributes with an example for each.

B) Write the pseudo code for Non-Recursive Predictive Parsing.

C) Explain the implementation of DAG using SDD with an example.

(10+5+5)

6. A) With the help of neat diagram, explain the concept of multi pass translation in assemblers.

B) Explain three kinds of assembly language statements.

C) For the following regular definition draw the transition diagram considering retract function.

 $Op \rightarrow < | > | << | >>$

(10+8+2)

7. A) Explain the various fields of general Activation record.

B) Write the three address code for the following expression and translate it to quadruple, triple and indirect triple.

(x+y)*(y+z)+(x+y+z)

C) Give the algorithm for partitioning three address instructions into basic blocks. Draw the flow graph for the given three address code below.

t1 = 2 * i t2 = a + t1 t3 = 2 * i t4 = b=t3 t5 = t2 * t4 t6 = p + t5 t7 = i + 1 i = t7if i < = 40 goto (1)

8. A) Consider the following code:

If (v1<v2) { v3 =10; } elseif (v1>v2) { v3 =20; } elseif (v1==v2) { v3 = 30; } v4 = 89;

Write three address code for above code.

B) Explain the buffer scheme that is used to handle large lookaheads safely and also the pointers involved in it.

C) Explain any three principles used in designing calling sequence and layout of activation records.

(6+8+6)

(4+8+8)