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Total Number of Pages: 02

**MCA
MCC404**

4th Semester Regular/Back Examination 2016-17

COMPILER DESIGN

Branch:MCA

Time: 3 Hours

Max marks: 70

Q.CODE:Z771

**Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.**

Q1 Answer the following questions: (2x10)

- a) What do you mean by cross compiler ?Is it possible to run a cross compiler upon two systems with Android and Windows operating systems respectively ?
- b) How intermediate code generation is useful for compilation ? Explain.
- c) What are the standard storage allocation strategies ? Explain.
- d) Convert the following into postfix notation
 $((a - n) * (a + n) / y^a)$
- e) Describe the technique to calculate FIRST ?
- f) What is syntax tree ?
- g) Explain the work of Inter procedural Analysis.
- h) What are the various data structures used in a symbol table.
- i) What is dead code elimination ? Explain.
- j) What is LEX ? How it is different from FLEX ?

Q2 a) Explain the various phases of compilation? Describe the output for the expression “ $R \rightarrow A * n ^ J / U$ ” after each phase. (5)

b) Find out the useful Grammar from the following set of Productions. (5)

$X \rightarrow xyz / Syzz$

$S \rightarrow Sz / xBx$

$B \rightarrow yBy / SR$

$R \rightarrow Ry / z$

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Q3 a) Consider the following grammar and show the handle of each right sentential form. $E \rightarrow E + E$

$E \rightarrow E * E$

$E \rightarrow id$

(5)

b) “A useful grammar is always leads towards a successful parse tree”. Justify this sentence with a suitable parse tree. (5)

- Q4 Perform a SLR parsing upon the following grammar ? Draw the SLR parsing table. (10)
- $S \rightarrow CC$
 $C \rightarrow cC$
 $C \rightarrow d$
- Q5 a) Consider the following, Draw a DAG and distinguish the Labeling of the Graph. (5)
- $t1 = a + b$
 $t2 = c + d$
 $t3 = e - t2$
 $t4 = t1 - t3$
- b) What are the difference between top down and bottom up parsing ? Explain. (5)
- Q6 a) What do you mean by code Optimization? Explain various code Optimization Techniques with a suitable example. (5)
- b) Discuss the structure of a symbol table. Explain how the symbol table is created for a block structured language. (5)
- Q7 a) Explain the three address code representation of Intermediate code Generation. (5)
- b) What is Garbage Collection ? What are its necessity ? Explain briefly. (5)
- Q8 **Write short note on any two** (5 x 2)
- a) Peephole optimization
b) YACC & BISON
c) LL(1) Parsing