PAPER ID-311478

Subject Code: KCA015

Roll No: | | | | | | | | | | | | | |

MCA
(SEM III) THEORY EXAMINATION 2023-24
COMPILER DESIGN

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	Marks	CO
a.	What do you mean by Cross Compiler?	2	1
b.	What is the role of lexical analysis phase?	2	1
c.	Describe the concepts of Predictive Parsing.	2	2
d.	What are the various conflicts that occur during shift reduce parsing?	2	2
e.	Give example for inherited and synthesized translation.	2	3
f.	Translate the arithmetic expression a* -(b+c) into 3-address code.	2	3
g.	What is heap allocation?	2	4
h.	Give the fields in an activation record.	2	4
i.	What do you mean by flow graph?	2	5
j.	Define code generation.	2	5

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SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a.	Define an ambiguous grammar. Give an example of unambiguous grammar and proof it is unambiguous.	10	1
b.	Explain various problems associated with top down parser.	10	2
c.	For the given assignment statements, write down the syntax directed definition – $S \rightarrow id = E$ $E \rightarrow E + E$ $E \rightarrow E * E$ $E \rightarrow -E$ $E \rightarrow id$	10	3
d.	Differentiate between stack allocation and heap allocation.	10	4
e.	Discuss various issues in design of code generator and code loop optimization.	10	5

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Define left factoring and left recursion of grammar. Is the following grammar is left recursive – $E \rightarrow E+E \mid E*E \mid a \mid b$	10	1
b.	Write short note on Formal grammar.	10	1

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	For the given grammar, construct SLR parsing table – $E' \rightarrow E$ $E \rightarrow E+E$ $E \rightarrow E*E$ $E \rightarrow id$	10	2

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b.	Construct parse tree for the following grammar and make operator precedence table. $E \rightarrow E+T \mid T$ $T \rightarrow T*F \mid F$ $F \rightarrow id$	10	2

5. Attempt any *one* part of the following: 10 x 1 = 10

a.	For the following code fragment, generate three address code –
	While(a>b)
	{
	If(c<d)
	X=y+z;
	Else
	X=y-z;
	}
		10	3

b.	Write short note on Syntax directed translation scheme.	10	3

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	What are lexical phase error and syntactic error? Also suggest methods for recovery of errors.	10	4
b.	Write short note on data structure for symbol table.	10	4

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	What are the various advantages of DAG? Discuss peephole optimization.	10	5
b.	How induction variables can be detected and eliminated from the given intermediate code. Discuss. B2 : i: = i+1 T1: = 4*j T2: = a[T1] If T2 < 10 goto B2	10	5

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