PAPER ID-310531

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

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B TECH
(SEM-V) THEORY EXAMINATION 2020-21
COMPILER DESIGN

Time: 3 Hours ***Total 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

Qno.	Question	Marks	CO
a.	What is YACC? Discuss about it.	2	CO 1
b.	Design a DFA for the following regular expression: $(x+y)^*xyy$	2	CO 1
c.	Consider the following grammar: S→B|SabS, B→bB| ε Compute FOLLOW(B)	2	CO 2
d.	Discuss about shift-reduce parsing.	2	CO 2
e.	Find the postfix notation for the following expression: (a+b+c)*(c+q)	2	CO 3
f.	Discuss about non-linear type intermediate code.	2	CO 3
g.	Write short note on "Activation Record"	2	CO 4
h.	Discuss about hash table.	2	CO 4
i.	Discus about constant folding.	2	CO 5
j.	Discuss about designing issues of code generator.	2	CO 5

SECTION B

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

Qno.	Question	Marks	CO
a.	Explain in detail the process of compilation for the statement a=b+c*70.	10	CO 1
b.	Construct the CLR(1) parsing table for the following grammar: S→AA, A→aA|b	10	CO 2
c.	Consider the following grammar and give the syntax directed definition to construct parse tree for the input expression 4*7+3*9. Also construct an annotated parse tree according to your syntax directed definition. E→E+T|T, T→T*F|F, F→num.	10	CO 3
d.	Explain lexical, syntax, semantic phase errors in detail.	10	CO 4
e.	Explain in detail about loop optimization.	10	CO 5

SECTION C

3. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	(i). Write a regular expression to represent a language consisting of strings made up of odd number of a & odd number of b. (ii). Write a CFG to represent the language $L=\{a^{n+m}b^n\|m,n\geq 1\}$.	10	CO 1
b.	(i). Check whether given grammar is ambiguous or not. If ambiguous then convert it into unambiguous grammar: E→E+E|E*E|id (ii). Discuss about cross compiler.	10	CO 1

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4. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Check whether the given grammar is LR(0) or not: S→PQy, P→Sy|x, Q→yS	10	CO 2
b.	Find the precedence and function table of the following grammar by using operator precedence technique. P→SR|S, R→bSR|bS, S→WbS|W, W→L*W|L, L→id	10	CO 2

5. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Translate the following arithmetic expression into quadruples and triples: (i). x=y*z+y*-z (ii). a=-b*(c+d)+b	10	CO 3

b.	Generate three address code for the following code:
	Switch p+q
	{
	case 1: x=x+1
	case 2: y=y+2
	case 3: z=z+3
	default: c=c-1
	}
		10	CO 3

6. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	What is symbol table? Explain various data structures used for symbol table.	10	CO 4
b.	(i). Explain the function of error handling phase of a compiler. (ii). Write short note on scoping.	10	CO 4

7. Attempt any *one* part of the following:

Qno.	Question	Marks	CO

a.	Construct the flow graph for the following code segment:
	fact(n)
	{
	int f=1;
	for(i=2; i≤n; i++)
	f=f*i;
	return f;
	}
		10	CO 5

b.	Define a DAG. Construct a DAG for the expression: p+p*(q-r)+(q-r)*s	10	CO 5

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