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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.	Discuss 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: $S \rightarrow PQy$ , $P \rightarrow Sy x$ , $Q \rightarrow yS$	10	CO 2
b.	Find the precedence and function table of the following grammar by using operator precedence technique. $P \rightarrow SR S$ , $R \rightarrow bSR bS$ , $S \rightarrow WbS W$ , $W \rightarrow L*W L$ , $L \rightarrow id$	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