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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Compiler Design (16CS524) **Course & Branch :** B. Tech - CSE

Year &Sem : III B.Tech& II-Sem **Regulation :** R16

UNIT-1

1.How many phases are there in a compiler? Explain each phase in detail? [L2, 10M]

2.a) Describe the role of lexical analysis in compiler design? [L1, 5M]
b) Explain Input Buffering with simple examples? [L2, 5M]
3. Explain about Language Processor in compiler Design? [L2, 10M]
4. Explain the following terms
a) Specification of Tokens [L2, 4+6M]
b) Recognition of Tokens
5.a)Explain the Structure of Compiler? [L2, 5M]
b) What is the need for separating lexical analysis and syntax analysis? [L2, 5M]
6. Explain LEX Tool with an Lex Programme? [L1, 10M]
7.Write short notes [L6, 5+5M]
a) pass and phases of a compiler
b) Bootstrapping
8. How to design the compiler by using the source program position:=intial+rate*60.[L2, 10M]
9. Write short notes [L6, 5+5M]
a) Application of compiler technology
b) Specification of Tokens
10 a)List the various phases of a compiler. [L1, 2M]
b)Differentiate tokens, patterns, and lexeme. [L4, 2M]
c) Differences between compiler and Interpreter. [L1, 2M]
d)Define Regular Expressions and Regular Grammar. [L1, 2M]
e) List the various error recovery strategies for a lexical analysis. [L1, 2M]

UNIT-2

1.a) Construct the recursive decent parser for the following grammar? [L4, 5M]

E-> E+T/T
T-> T*F/F
F-> (E)/id

b) Explain about Left factoring and Left Recursion with an examples? [L2, 5M]

2. Define augmented grammar? Construct the LR(0) items for the following Grammar? [L1, 10M]

S->L=R
S->R
L->*R
L->id
R->L

3. Calculate FIRST and FOLLOW for the following grammar? [L3, 5M]

a) E-> E+T/T
T-> T*F/F
F-> (E)/id

b) S->xABC [L3, 5M]
A->a|bbD
B->a|ε
C->b| ε
D->c| ε

4. Construct Predictive Parse Table for the grammar E->E+T/T,T->T*F/F,F->(E)|id and parse the string id+id*id. [L3, 5M]

5. Perform Shift Reduce Parsing forthe following

i) S->(L)|a
L->L,S|S input string: (a,(a,a))

. ii) E-> E+E / E*E / (E) / id input string (id*id+id) [L3, 5M]

6. Construct CLR Parsing table for the given grammar [L3, 10M]

S->CC
C->aC/d

7. Consider the grammar [L3, 10M]

S->AB|ABad
A->d
E ->b
D->b| ε
B->c

Construct the predictive parsing table. Show that the given grammar is LL(1) or not

8. Consider the grammar S->xABC
   A->a|bbD
   B->a|ε
   C->b| ε
   D->c| ε
   Construct predictive parsing table for the given grammar. [L3, 10M]
9. Perform Shift Reduce Parsing for the input string using the grammar. [L4, 5+5M]
   S->(L)|a
   L->L,S|S
   a) (a,(a,a))
   b) (a,a)
10 a) Define LL(1)? [L1, 2M]
   b) Differences between SLR,CLR, LALR parsers? [L1, 2M]
   c) Problems in Top Down Parsing? [L1, 2M]
   d) Define Handle prunig?. [L1, 2M]
   e) DefineAmbiguous grammar? [L2, 2M]

UNIT-3

1. Explain syntax directed definition with simple examples? [L2, 10M]
2. Describe the evaluation order of SDT with an example. [L5, 10M]
3. Explain the Type Checking with suitable examples? [L2, 10M]
4. Explain the Translation scheme of SDD. [L2, 10M]
5. Describe the representation of 3-address code with an examples. [L5, 10M]
6. Explain in detail about Backpatching Technique?. [L2, 10M]
7. Explain the applications of Syntax Directed Definition. [L2, 10M]
8. Write down the translation procedure for control statement? [L6, 10M]
9. Explain different types of intermediate code representations? [L2, 10M]
10. a) Define a syntax-directed translation. [L1, 2M]
    b) Define annotated parse tree. [L1, 2M]
    c) What are the three functions of backpatching? [L1, 2M]
    d) Write the Syntax of case statement?. [L6, 2M]
    e) Differentiate between L attribute and S attribute. [L4, 2M]

UNIT-4

1. Draw the format of Activation Record in stack allocation and explain each field in it. [L4, 10M]
2. Explain about Global data flow analysis. [L2, 10M]
3. Explain theStorage Organization with simple examples. [L2, 10M]
4. Define Symbol table. Explain different types of Data structure for symbol table [L1, 10M]
5. Distinguish between static scope and dynamic scope. Briefly explain access to non-local Names in static scope. [L4, 10M]

6. Explain the Non Block Structured Languages? [L2, 10M]
7. Explain Storage allocation strategies with suitable examples? [L2, 10M]
8. Explain heap management mechanism. [L2, 10M]
9. Explain about block structured language. [L6, 10M]

10 a) Define Activation Record. [L6, 2M]
b) Name any four procedural optimization techniques [L6, 2M]
c) Define scope and life time of variable. [L1, 2M]
d) Define symbol table. [L1, 2M]
e) Define data flow equation?. [L1, 2M]

UNIT-5

1. Write about all issues in code generation. Describe it. [L6, 10M]
2. Explain the target machine architecture? [L2, 10M]
3. Explain optimization techniques on Basic Blocks with simple examples? [L2, 10M]
4. Describe the various strategies in register allocation. [L5, 10M]
5. Explain the peephole optimization Technique?. [L2, 10M]
6. Construct the DAG for following statement. a+b*c+d+b*c [L3, 10M]
7. Construct the DAG for the following basic blocks [L3, 10M]

1. t1:=4*i
2. t2:=a[t1]
3. t3:=4*i
4. t4:=b[t3]
5. t5:=t2*t4
6. t6:=prod+t5
7. prod:=t6
8. t7:=i+1
9. i:=t7
10. if i<=20 goto 1

8. Explain the simple code generator and generate target code sequence for the following statement d:=(a-b)+(a-c)+(a-c) [L2, 10M]
9. Write short notes on i)Simple code generator [L6, 5+5M]
ii) Register allocation
10. Explain the following terms
a) Role of peephole optimization in compilation process [L1, 2M]
b) Issues in the design of a code generator.(any 4) [L6, 2M]
c) Give the different forms in target program [L1, 2M]
d) Give the applications of DAG. [L1, 2M]
e) Define Dead-code elimination with example. [L1, 2M]