

## **COMPILER DESIGN IMPORTANT QUESTIONS.**

### **Unit -1**

#### **SHORT QUESTIONS:**

Define compiler.
What is Context free grammar?
Define pre-processor. What are the functions of pre-processor?
What is input buffer?
Differentiate compiler and interpreter
What is input buffering?
Define the following terms: a) Lexeme b) Token
Define interpreter.
What are the differences between the NFA and DFA?

#### **LONG questions:**

Explain the various phases of a compiler with an illustrative example
Define Regular expression. Explain the properties of Regular expressions.
Differentiate between top down and bottom up parsing techniques.
Construct an FA equivalent to the regular expression $(0+1)^*(00+11)(0+1)^*$
Explain the various phases of a compiler in detail. Also write down the output for the following expression: position: =initial + rate * 60
Construct an FA equivalent to the regular expression $10+(0+11)0^*1$

### **Unit -2**

#### **Short questions :**

Define augmented grammar
Compare the LR Parsers.
Compare and contrast LR and LL Parsers
Differentiate between top down parsers
Define Dead code elimination?
Eliminate immediate left recursion for the following grammar: E->E+T   T T->T* F   F F-> (E)   id
Mention the types of LR parser.
Explain bottom up parsing method

**LONG questions :**

Discuss in about left recursion and left factoring with examples.

Construct the predictive parser for the following grammar

$S \rightarrow (L)/a$

$L \rightarrow L, S/S$

Check whether the following grammar is SLR (1) or not. Explain your answer with Reasons.

$S \rightarrow L=R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow id$

$R \rightarrow L$

Construct SLR parse table

for  $S \rightarrow L=R/R$

$R \rightarrow L$

$L \rightarrow *R/id$

State and explain the rules to compute first and follow functions

$E \rightarrow E + T/T$

$T \rightarrow T * F/F$

$F \rightarrow F^*/a/b$

Construct CLR parse table for

$S \rightarrow L=R/R$

$R \rightarrow L$

$L \rightarrow *R/id$

Construct the LR Parsing table for the following grammar:

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E)/id$

Construct an LALR Parsing table for the following grammar:

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow id$

Find the SLR parsing table for the given grammar:

$E \rightarrow E + E \mid E * E \mid (E) \mid id$

And parse the sentence  $(a+b)^*$

**UNIT-3****SHORT QUESTIONS:**

Define Type Equivalence

Explain the role of intermediate code generator in compilation process

Define left most derivation and right most derivation with example

What are the various types of intermediate code representation?

Write a note on the specification of a simple type checker.

Explain intermediate code representations?

Define type expression with an example?

State general activation record?

Explain type expression and type systems

**LONG QUESTIONS:**

Explain in brief about equivalence of type expressions with examples

Explain about Type checking and Type Conversion with examples

What is a three address code? Mention its types. How would you implement the three address statements? Explain with examples.

What is type checker? Explain the specification of a simple type checker

Translate the following expression:

$(a + b) * (c + d) + (a + b + c)$  into

a) Quadruples b) Triples

Construct a quadruple, triples for the following expression:

$a + a * (b - c) + (b - c) * d$ ?

Explain various storage allocation strategies with examples.

Explain static and stack storage allocations?

**UNIT -4****SHORT QUESTIONS**

Write the quadruple for the following expression

$(x + y)*(y + z) + (x + y + z)$

What is a DAG? Mention its applications.

What are Abstract Syntax trees?

Define address descriptor and register descriptor

Discuss about common sub expression elimination

What is a Flow graph?

Define constant folding?

Define reduction in strength?

Explain the issue and the difference between the heap allocated activation records versus stack allocated activation records

Write the principal sources of optimization

Discuss about the following:

- a) Copy Propagation
- b) Dead code Elimination
- c) Code motion.

Explain Lazy-code motion problem with an algorithm

Explain the following with an example:

- a) Redundant sub expression elimination
- b) Frequency reduction
- c) Copy propagation

Explain various method to handle peephole optimization.

Explain the following peephole optimization techniques:

- a) Elimination of Redundant Code
- b) Elimination of Unreachable Code

Illustrate loop optimization with suitable example.

Explain various code optimization techniques in detail.

**LONG QUESTIONS :**