Question Paper Code : 8378

B.Tech. (Semester-V) Examination, 2021

(Odd Semester)

COMPILER DESIGN

[Paper : CS-505]

Time : Three Hours] **[Maximum Marks : 70**

Note : Answer **any five** questions. Each question carry **equal** marks.

1. Describe various phases of a compiler with example ? Differentiate a phase and pass. Compare multipass and single pass compiler. Write application of compiler. [14]

2. (a) Give the rules for computation of FIRST(X) and FOLLOW(X). Construct FIRST and FOLLOW sets for the following grammar. [7×2=14]

E-->TE'

E'-->+TE'|e

T-->FT'

T'-->*FT'|e

F-->(E)|id

(b) What do you mean by left most derivation and right most derivation. Explain with an example.

3. (a) Consider the following grammar. [7×2=14]

S-->0A/1B/0/1

A-->0S/1B/1

B-->0A/1S

Construct leftmost derivations and parse trees for the following sentences

(i) 0101

(ii) 1100101

(b) Differentiate between Compiler and Interpreter. Find the number of token in the following C statement :

printf("i=%d,&i=%x",i,&i);

4. (a) Describe Data structure for symbol table. What are the various operations performed on the symbol table ? Explain. [7×2=14]

(b) Explain logical phase error and syntactic phase error. Also suggest methods for recovery of error.

5. (a) What is ambiguous grammar ? Eliminate ambiguities for the grammar : [7×2=14]

E-->E+E|E*E|(E)|id.

(b) Compare and contrast the quadruples, triples and indirect triples.

6. (a) What is Syntax Directed Translation ? Differentiate between S-attributed definitions and L-attributed definitions with example. [7×2=14]

(b) What is code optimization ? What are its advantages? What are the problems in optimizing compiler design?

7. (a) Explain Tokenization. How many types of token are used in programming ? [7×2=14]

(b) What is Loop optimization and Global data analysis ? Explain with example.

8. (a) What is bootstrapping in compiler design ? Explain yacc compiler and Relocatable Machine Code ? [7×2=14]

(b) Differentiate between Common sub-expression elimination and Dead-code elimination with suitable example.

9. (a) What is Directed Acyclic Graph (DAG) ? How it can be used to eliminate expression ? Give example. [7×2=14]

(b) Consider the grammar with non-terminals N={S,C,S1}, terminals T={a,b,i,t,e}, with S as the start symbol, and the following set of rules :

$S \rightarrow iCtSS_1 | a$

$S_1 \rightarrow eS | \in$

$C \rightarrow b$

Check whether given grammar id LL(1) or not. Given reason.

10. Explain the following in detail : [14]

(i) Copy Propagation

(ii) Live variables analysis

(iii) Block structure

(iv) Activation record

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