Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(CSE Engg./E-Security) (Sem.–2)
COMPILER DESIGN
Subject Code : CS-506
Paper ID : [E0686]

Time : 3 Hrs.   **Max. Marks : 100**

INSTRUCTION TO CANDIDATES :
1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1) What are the various phases of a compiler? Explain with example.

2) a. What is the difference between phase and pass? Give example of a language which uses more than one pass for compiling a program.

   b. What is boot strapping? Explain the use of boot strapping in compiler design.

3) a. Explain a translation scheme to translate assignment statement with mixed type.

   b. A list structure can be defined as follows :

   i) ^ is a (null) list structure.

   ii) A (an atom) is a list structure.

   iii) If l1, l2,……lk are list structures, k ≥ 1, then.

   (l1, l2…….lk) is a list structure

   a) Construct a grammar for list structure.

   b) Draw a parse tree for (((A,A), ^,(A)),A) in the grammar.

4) a. Suppose A[–4:5,–3:3] is a 10 × 7 integer array whose first script ranges from –4 to + 5, and whose second ranges from –3 to 3. Write code to assign A[I,J]:=0, assuming A is stored in row major form beginning at location 1000 in a byte addressed machine with six byte per word.

   b. Let +, *, ^ stand for addition, multiplication and exponential but with non Standard precedences and associativities. Evaluate $1+1*2^1*1^2^2$ on the assumption that the order of precedence is +(highest), *, and ^ with all operators left associative.

5) a. What is a control flow representation for Boolean expression? Explain with example.

b. Write quadruples, triples, and indirect triples for the expression

–((A/B)+B)*(C+(D*E))–(A+B+C)

6) a. What is a lookahead operator? How this feature is used in lexical analyzers?

b. Give a DFA for the set of all strings beginning with 1 which, interpreted as the binary representation of an integer, is congruent to 5.

7) What is recursive descent parsing? Why left factoring is essential in the case of recursive descent parsing? Left factor the following grammar.

S → i c t s|i c t s e s| a

C → b

8) Explain the following :

a. Loop optimization

b. Flow graph