ROLL NO. _____

ALCCS – OLD SCHEME

Code: CS22 **Subject: SYSTEM SOFTWARE**
Time: 3 Hours **Max. Marks: 100**

AUGUST 2011

NOTE:

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1 a. Define Sequencing Symbol and Expansion Time Variable.

b. List four software tools that assist a programmer during program testing and debugging.

c. Write brief note on Chomsky hierarchy of grammar.

d. What is the difference between pure and impure interpreters? Explain.

e. Let the free list consists of two areas say $area_1$ and $area_2$ of 500 and 200 words respectively. Let allocation requests for 100 words, 50 words and 400 words arise in the system. How will first fit and best-fit technique allocate the memory?

f. Explain the similarities and differences between the use of Macros and the use of subroutines.

g. Construct a DFA that can recognize identifiers, unsigned integers and unsigned real numbers with fractions. **(7 × 4)**

Q.2 a. Show the output of two-pass linker in terms of object code, definition table, use table of the two assembler language programs given below

```
A   START  0          B   START 0
    INTDEF W           W   INTUSE
Z   INTUSE                 INTDEF Z
    LOAD Y                 LOAD W
    STORE Z                STORE X
W   CONST 15           X   SPACE
Y   CONST 13           Z   SPACE
    END                    END
```

(12)

b. Write a brief note on following assembly statements:
OPSYN, EQU and SET. **(6)**

Q.3 a. What is an LL(1) parser? Is there any advantage of using LL(1) parsing. Construct a parser table for an LL(1) parser for the following grammar

E ::= TE'
E' ::= +TE'| ε
V ::= VT'
T' ::= *VT'| ε
V ::= <id> **(12)**

b. What do you mean by code optimization? What is the aim of this phase? Explain elimination of common sub expressions during code optimization. **(6)**

Q.4 a. Briefly explain backpatch technique. Using backpatch technique, generate annotated parse tree for the expression

P<Q or R<S and X<Y. **(12)**

b. Define collision in Hash table organization. Briefly describe one of the methods for collision handling. **(6)**

Q.5 a. Compare and contrast the various parameter passing mechanisms in terms of execution efficiency and power to produce side effects. **(6)**

b. What is a language processor? Discuss its various categories. **(6)**

c. Define loading and linking. Briefly explain role, advantages and disadvantages of an absolute loader. **(6)**

Q.6 a. Explain static and dynamic memory allocation models of memory allocation. What is automatic allocation and program controlled allocation? **(6)**

b. List the tasks performed by the analysis and synthesis phases of an assembler. **(6)**

c. Give one linear and one non-linear search data structures. Describe implementation of the three basic operations for each of them. **(6)**

Q.7 Write notes on any **FOUR** of following:

(i) Lexical substitution during macro expansion
(ii) Recursive-descent parser
(iii) Yacc
(iv) Features of stack-based allocation method
(v) Redefinable symbols **(4×4.5)**