MCA 302

INDIRA GANDHI NATIONAL TRIBAL UNIVERSITY
AMARKANTAK (M.P.)

End Semester Examination- 2018

M.C.A. - III Semester

Computer Science

System Software and Compiler

Time:- Three Hours ***Maximum Marks: 60***

Note : There are five questions from five unit. Attempt all five questions. The figures in the margin indicate full marks for the questions.

Unit-1

1.

(a) What is forward references? What is the difference between one pass and two pass assembler. (6)

(b) Write a program in 8085 to perform the substraction of two 8 bit numbers. (6)

Or

(a) Explain any two addressing mode in microprocessor with example. (6)

(b) Explain following (6)

1) What is system software? Explain.
2) Bring out the basic functions of assembler.

Unit-II

2.

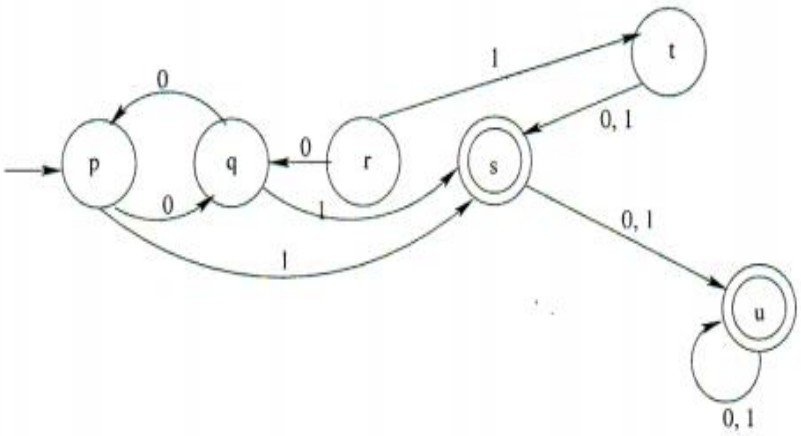
(a) Define deterministic finite automata (DFA) and draw FA for following string. (6)

1) String over {0, 1} start with 01 and ending with 0.
2) Contain even no. of 1 and odd no. of 0.

(b) What is the main role of lexical analysis, draw the transition diagram of user defined identifiers. (6)

Or

(a) Minimized the given DFA. (6)



(b) How to specify the tokens? Differentiate token, lexeme and pattern with suitable examples. (6)

Unit-III

3.

(a) Construct the following augmented grammar (6)

$S' \rightarrow Sc$

$S \rightarrow SA \mid A$

$A \rightarrow aSb \mid ab$

1) Find LR(0) items
2) Construct goto graph

(b) Explain following statement (6)

1) Canonical LR parser is more powerful than LALR parser
2) Capabilities of context free grammars

Or

(a) Why CLR(1) is more powerful than LALR(1), Constructing CLR(1) parsing table for given grammar (6)

$S \rightarrow AA$
$A \rightarrow aA|b$

(b) Write short note on following (6)
1) YACC
2) Ambigues grammar

Unit-IV

Q.4
(a) Explain in detail storage allocation for compilation of program. (6)
(b) Consider following grammar (6)

$S \rightarrow EN$
$E \rightarrow E+T \mid E-T \mid T$
$T \rightarrow T*F \mid T/F \mid F$
$F \rightarrow (E) \mid digit$
$N \rightarrow ;$
1) Write Syntax Directed Translation
2) Construct Syntax Tree for expression 5+6*7-3

Or

(a) Write the quadruple, triple, indirect triple for the expression (6)

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

(b) What are the content of symbole table? Explain in detail the symbol table organization for block structured language. (6)

Unit-V

Q.5

(a) What do you mean by code optimization, Explain following techniques with example. (9)

1) Common expression
2) Loop optimization
3) Dead code elimination

(b) Define directed acyclic graph (DAG) with suitable example. (3)

Or

(a) What do you mean by DAG, construct basic block and data flow graph for the following (8)

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p = p + a[i] * b[i];
  i=i+1;
until i>20
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(b) Explain peephole optimization technique with suitable example. (4)

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