Total No. of Questions: 05 Total No. of Printed Pages: 02

Roll No. ________________

BTCS601

Common for B.Tech. / B.Tech. + M.B.A. / B.Tech. + M.Tech.(CSE/IT) Programs

VII Semester Examination, June 2024

Compiler Design

Choice Based Credit System (CBCS)

Time: 3 Hrs. **Maximum Marks: 60**

Minimum Pass Marks: 24

Note: (1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.

(2) From each question, part 'A' and 'B' are compulsory and part 'C' has an internal choice.

(3) Draw a neat diagram, wherever necessary.

(4) Assume suitable data wherever necessary.

Q.1(A) What are the various phases of a compiler? Explain with a neat diagram and example. **03**

(B) What is Input Buffering? **03**

(C) Explain Compiler-Construction tools. What is "YACC" Tool and how does YACC work? **06**

OR

What is the "LEX" Tool for Lexical Analysis? Describe structure of the LEX Program.

Q.2(A) Describe the operator precedence parsing algorithm. **03**

(B) Consider the following grammar and construct the predictive LL (1) parsing table. **03**

$S \rightarrow aABb$ $A \rightarrow c \mid \varepsilon$ $B \rightarrow d \mid \varepsilon$

Check with input string "acb".

(C) Construct the SLR parsing table for the following grammar. **06**

$S \rightarrow CC$ $C \rightarrow cC$ $C \rightarrow d$

Parse with input string "cdd".

OR

Show that the given grammar is LALR (1).

$S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b$

Q.3(A) What is the difference between synthesized and inherited attributes? Also give examples. **03**

(B) Explain annotated parse tree with example. **03**

Contd...

(C) Construct Three Address Code for the following: **06**

If [(a<b) and ((c>d) or (a>d))]

then z = x+y*z

else z = z+1

OR

Generate the three-address code for the following program fragment:

for (i=1 ; i< = 10 ; i ++)

{

a [i] = x*5;

}

Q.4(A) Describe different storage allocation strategies. **03**

(B) Translate the expression into Quadruples, Triples, and Indirect Triples: **03**

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

(C) Construct a DAG for the given expression and generate the code: **06**

(a-b) + c * (d/e)

OR

Explain the principle sources of optimization with suitable examples.

Q.5(A) Explain in brief the various issues in the design of target code generator. **03**

(B) What are the basic blocks and flow graphs? **03**

(C) What do you mean by peephole optimization? Explain the characteristics of peephole optimization with suitable examples. **06**

OR

What is global data flow analysis? Explain its role in code optimization. Describe data flow properties.

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