

7E 7035

Roll No. _____

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B.Tech. VII Semester (Main & Back) Examination, Dec. 2015
Computer Science & Engineering
7CS5A Compiler Construction

Time : 3 Hours**Maximum Marks : 80**
Min. Passing Marks : 24**Instructions to Candidates:**

Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. Explain the difference phases of compiler design with the help of suitable diagram? (16)

OR

1. Write a regular expression and construct a transmission diagram of the following:
- Identifier and keywords in pascal
 - Unsigned numbers in pascal. (16)

Unit - II

2. Consider the following grammar G:-

$$E \rightarrow TE'$$

$$E' \rightarrow +TE' \mid \epsilon$$

$$T \rightarrow FT'$$

$$T' \rightarrow *FT' \mid \epsilon$$

$$F \rightarrow (E) \mid id$$

Where ϵ denotes the empty string of symbols

- i) Compute FIRST and FOLLOW for each nonterminal OF the grammar G.
- ii) Construct a predictive parsing table for grammar G. (16)

OR

2. Explain why Bottom-up parsing is more generally applicable than top-down parsing? (16)

Unit - III

3. Define syntax directed definition. Explain the various forms of syntax directed definition? (16)

OR

3. Translate the arithmetic expression: $(a+b)*(c+d)+(a+b+c)$ into
 - i) Syntax tree
 - ii) Three address code
 - iii) Quadruple
 - iv) Triples
 - v) Indirect triples. (16)

Unit - IV

4. Write short notes on
 - i) Symbol Table
 - ii) Storage allocation strategies
 - iii) Activation Record (16)

OR

4. Differentiate between stack allocation & heap allocation? (16)

Unit - V

5. Consider the program for dot product calculation:

Begin

Prod := 0

i := 0

do

Begin

Prod := Prod + a [i] * b [i]

i := i + 1

End

While i <= 20

- i) Construct flow graph from three address code.
- ii) Optimize this code reduce for common sub-expression, loop invariants, induction variables and reduction in strength.
- iii) Find the basis block and construct the flow graph. Optimize the code by applying function preserving transformation. (16)

OR

5. Construct the tree for following expression and apply labelling algorithm for optimal ordering $x*(y+z)-z/(u-v)$ (16)