

MID SEMESTER SUPPLEMENTARY EXAMINATION – 2017

School of Computer Engineering
KIIT University, Bhubaneswar - 24

COMPILER DESIGN CS- 3002

Full Marks: 25

Time: 2 Hrs

Answer any five questions including the question No.1 which is compulsory

The figures in the margin indicates full marks

*Candidates are required to give their answers in their own words as far as practicable and
all parts of a questions should be answered at one place only*

1 X 5 = 5

Q1. Answer the following questions:

a) Define token? Find out the no of tokens present in the following statement?

If(a > b)

{

Printf("I=%d, & I=%x", I, &I);

}

b) Define Syntax Directed Translation. Explain annotated parse tree with example.

c) Differentiate between phases and passes of compiler?

d) Eliminate left recursion from the grammar.

$S \rightarrow Aa / b, A \rightarrow Ac / Sd/e?$

e) Define augmented grammar? Give the importance of augmentation?

Q2. a) Explain all phases of compiler and describe the function of each with an example.

2 X 2.5 = 5

b) Give a parse trees and derivations (both LMD & RMD) for the following grammar and input string.

$E \rightarrow E + T / T$

$T \rightarrow T * F / F$

$F \rightarrow (E) / a$

Input String: (i) $(a+a) * (a*a)$

(ii) $a + (a*a) * a$



Q3. a) Write the recursive descent parser for the following grammar

2 X 2.5 = 5

$E \rightarrow TA$
 $A \rightarrow +TA / \epsilon$
 $T \rightarrow FB$
 $B \rightarrow *FB / \epsilon$
 $F \rightarrow (E) / id$

b) Translate the statement $x=(a+b)*-c/d$ into:

- Quadruples.
- Triples.

Q4. Find the FIRST and FOLLOW of the following:

2 X 2.5 = 5

- a) $S \rightarrow aBDh / bBc$
 $B \rightarrow eC$
 $C \rightarrow bC / \epsilon$
 $D \rightarrow EF$
 $E \rightarrow g / \epsilon$
 $F \rightarrow f / \epsilon$
- b) $S \rightarrow ACB / cbB / Ba$
 $A \rightarrow da / BC$
 $B \rightarrow g / \epsilon$
 $C \rightarrow h / \epsilon$

Q5. a) Construct the DAG for the following expression.

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

2 X 2.5 = 5

b) Define basic blocks. Explain program flow graph with an example.

Q6. Explain different types of optimization techniques with example.

5

Q7. a) Write a lex program to count the number of positive integers, positive fractional integers, negative integers and negative fractional integers from a file.

2 X 2.5 = 5

b) Consider the following grammar G:

$S \rightarrow \text{if Expr then } S \text{ else } S$
 $S \rightarrow \text{if Expr then } S$
 $S \rightarrow \text{other}$

Is G SLR(1) ? Justify.