

United College of Engineering & Management
Department of Computer Science & Engineering

Subject: Compiler Design (RCS602)

Faculty Name: Mr. Anil Singh

Year/Sem: 3rd year/6th sem

Unit-5

- 1) Define peephole optimization. [2019, 2018]
- 2) What is global data flow analysis? How does it use in code optimization? [2019, 2018, 2016, 2015]
- 3) How would you represent the following equation using DAG? [2019]
$$a := b * -c + b * -c$$
- 4) Write short notes on the following with the help of example: [2019, 2016]
 - i) Loop unrolling
 - ii) Loop Jamming
 - iii) Dominators
- 5) Explain what constitute a loop in flow graph and how will you do loop optimizations in code optimization of a compiler. [2019, 2015]
- 6) What is DAG? [2018, 2017, 2016, 2015]
- 7) What is Data Flow Analysis? [2018]
- 8) Construct the DAG for the expression: [2018]
$$a + a * (b - c) + (b - c) * d + e + e * (f - g) + (f - g) * h$$
- 9) Explain different type of Loop Optimization Technique briefly. [2018]
- 10) List out the criteria for code improving transformations. [2017]
- 11) Represent the following in flow graph $i=1; \text{sum}=0; \text{while}(i \leq 10)\{\text{sum} += i; i++\}$ [2017]
- 12) What is the use of algebraic identities in optimization of basic blocks? [2017]
- 13) Write an algorithm to partition a sequence of three address statements into basic blocks. [2017]

14) Discuss in detail the process of optimization of basic blocks. Give an example. [2017]

15) How to subdivide a run-time memory into code and data areas. Explain. [2017]

16) Construct a DAG and write the sequence of instructions for the expression $a + a * (b - c) + (b - c) * d$. [2017]

17) How DAG is different from Syntax Tree? Construct the DAG for the following basic blocks. [2016]

$a := b + c$

$b := b - d$

$c := c + d$

$e := b + c$

Also explain the key applications of DAG.

18) Consider the following sequence of three address codes: [2016]

1. $Prod := 0$

2. $I := 1$

3. $T1 := 4 * I$

4. $T2 := \text{addr}(A) - 4$

5. $T3 := T2[T1]$

6. $T4 := \text{addr}(B) - 4$

7. $T5 := T4[T1]$

8. $T6 := T3 * T5$

9. $Prod := Prod + T6$

10. $I := I + 1$

11. If $I \leq 20$ goto (3)

Perform Loop Optimization.

19) What are DAG advantages in context of optimization? [2015]