

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID TERM TEST-2

SUMMER SEMESTER - JUNE 2016

B.Tech/ 5th Semester

COURSE CODE:

MAX. MARKS: 50

COURSE NAME: COMPILER DESIGN

COURSE CREDITS: 4

MAX. TIME: 2 Hrs

Note: Please read all the instructions carefully.

Section-A: Attempt any Five Questions. Each Question Carry Three Marks [3 × 5 = 15]

1. Discuss the role of syntax directed translation (SDT) in compilation? What is peephole optimization? Explain the importance of Code Generator.
2. Mention the importance of Symbol Table during the compilation. Name the various data structures used for symbol table organization.
3. Draw the DAG for the expression: if $a > 0$ then $a = 3 * (b+1)$ else $b = b+1$
4. Explain the pros and cons for static allocation, stack allocation and heap allocation strategies.
5. Discuss the following parameter parsing technique with suitable example:
 - (i) Call by value
 - (ii) Call by reference
 - (iii) Call by name
6. Consider the following source language statements as follows; if $A + 2 > 3 * (B-1) + 3$ then $C=0$. Write down the three address code corresponding the above mentioned expression.

Section-B: Attempt any three Questions. Each Question Carry Five Marks [3 × 5 = 15]

7. Why three address code generation is considered as one of the most important part of compilation step? Show all the phases of compiler using the statement "*position=initial + rate × 120*".

8. Show the semantic rules for the following production of a grammar:

$$L \rightarrow E_n$$

$$E \rightarrow E_1 + T$$

$$E \rightarrow T$$

$$T \rightarrow T_1 * F$$

$$T \rightarrow F$$

$$F \rightarrow (E)$$

$$F \rightarrow \text{digit}$$

9. Explain the following with the help of an example;

(a) Local Common Subexpression elimination (b) Dead Code Elimination (c) Pointer Assignments and Procedure Calls

10. Translate the expression: $A := -B * (C + D) / E$ into Quadruples and Triples representations.

Section-C: Compulsory Questions [20 Marks]

11. (a) Consider the augmented grammar given as follows; [12 Marks]

$$S' \rightarrow S$$

$$S \rightarrow AA$$

$$A \rightarrow aA$$

$$A \rightarrow b$$

Construct the LR(1) parsing table if possible. Parse the string baab using the table if it exists.

(b) Consider the Grammar mentioned above and construct the LALR(1) parsing table for the same. [8 Marks]

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