

NTK/KW/15 - 7564

Seventh Semester B. E. (Computer
Technology) (CBS) Examination

COMPILERS

Time : Three Hours]

[Max. Marks : 80

- N. B. : (1) All questions carry marks as indicated.
Solve Question 1 OR Question No. 2
Solve Question 3 OR Question No. 4
Solve Question 5 OR Question No. 6
Solve Question 7 OR Question No. 8
Solve Question 9 OR Question No. 10
Solve Question 11 OR Question No. 12
(2) Due credit will be given to neatness and adequate dimensions.
(3) Illustrate your answers wherever necessary with the help of neat sketches.
(4) Use of non-programmable calculator is permitted.

1. (a) Comment on the following statements:—
- (i) A multipass compiler can be made you use less space than a single pass compiler.
 - (ii) The lexical analyzer may be required to search many characters beyond the next token in order to determine what the next token actually is. 6
- (b) Can compiler be implemented in its own language. Explain how. 5
- (c) Removal of which phase (s) makes a compiler an interpreter ? 2

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Contd.

OR

2. (a) Explain the phases of compiler. 7
(b) Write LEX program that recognizes keywords if / while / for ; identifier ; Real numbers. 6
3. (a) Obtain LL(1) parsing table for the following grammar :
 $S \rightarrow abSa / aaAc/b$
 $A \rightarrow abAb / \epsilon$ 6
(b) Comment on following statements :—
(i) Left recursive grammar is not suitable for top down parser.
(ii) Every unambiguous grammar is LR grammar. 8

OR

4. (a) Comment on the following statement :—
"The following grammar is LR (1) but not LALR"
 $S \rightarrow Aa / bAc / Bc / bBa$
 $A \rightarrow d$
 $B \rightarrow d$ 9
(b) Give the significance of FIRST and FOLLOW in top down parsing. 5

5. (a) Write SDTS for switch statement and translate following statement into TAC :

Switch (x)

```
{ case 1 : {a=b ; break ; }
```

```
case 2 : switch (a)
```

```
{ case 1 : {b=2 ; break ;}
```

```
case 2 : {b = a+2 ; break;}
```

```
}
```

```
break ;
```

```
Default : a = 10 ; break ;
```

```
}
```

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OR

6. (a) Write SDTS for repeat-until statement. 5

- (b) Write and explain syntax directed translation scheme for array reference. 8

7. (a) Explain different data structures used for symbol table. Also compares pros and cons of each. 6

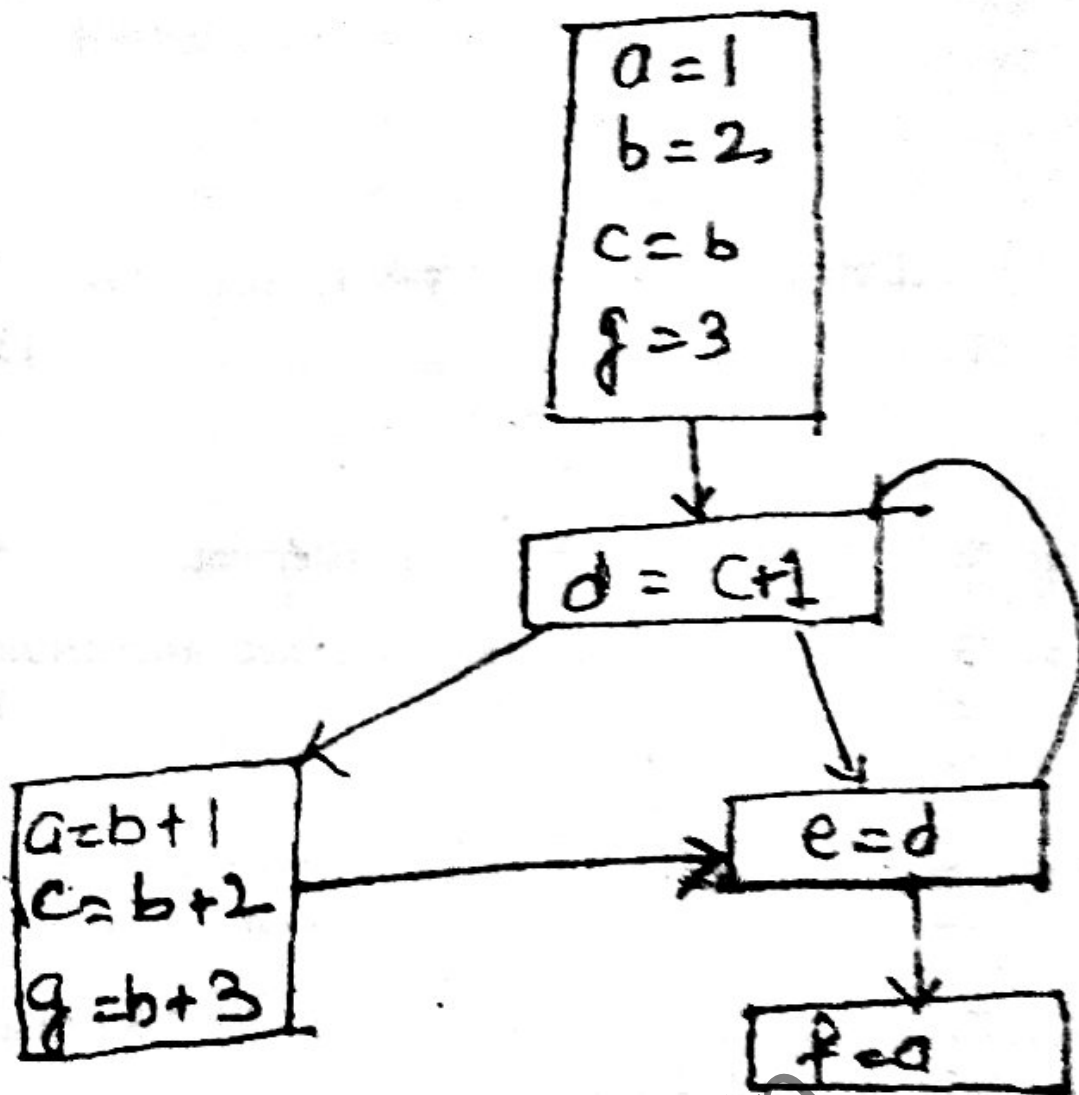
- (b) Explain phrase level error recovery for LR parser with suitable example. 7

OR

8. (a) How can scope information be represented in symbol table ? 6

(b) What is an activation record ? When this record need to be set up ? Explain meaning of each information stored in an activation record. 7

9. Consider the following flow graph. Calculate u-d chain for all the statement which are inside the loop and remove loop invariant computation.



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OR

10. Write a short note on :—

(i) DAG

(ii) Reducible flow graph.

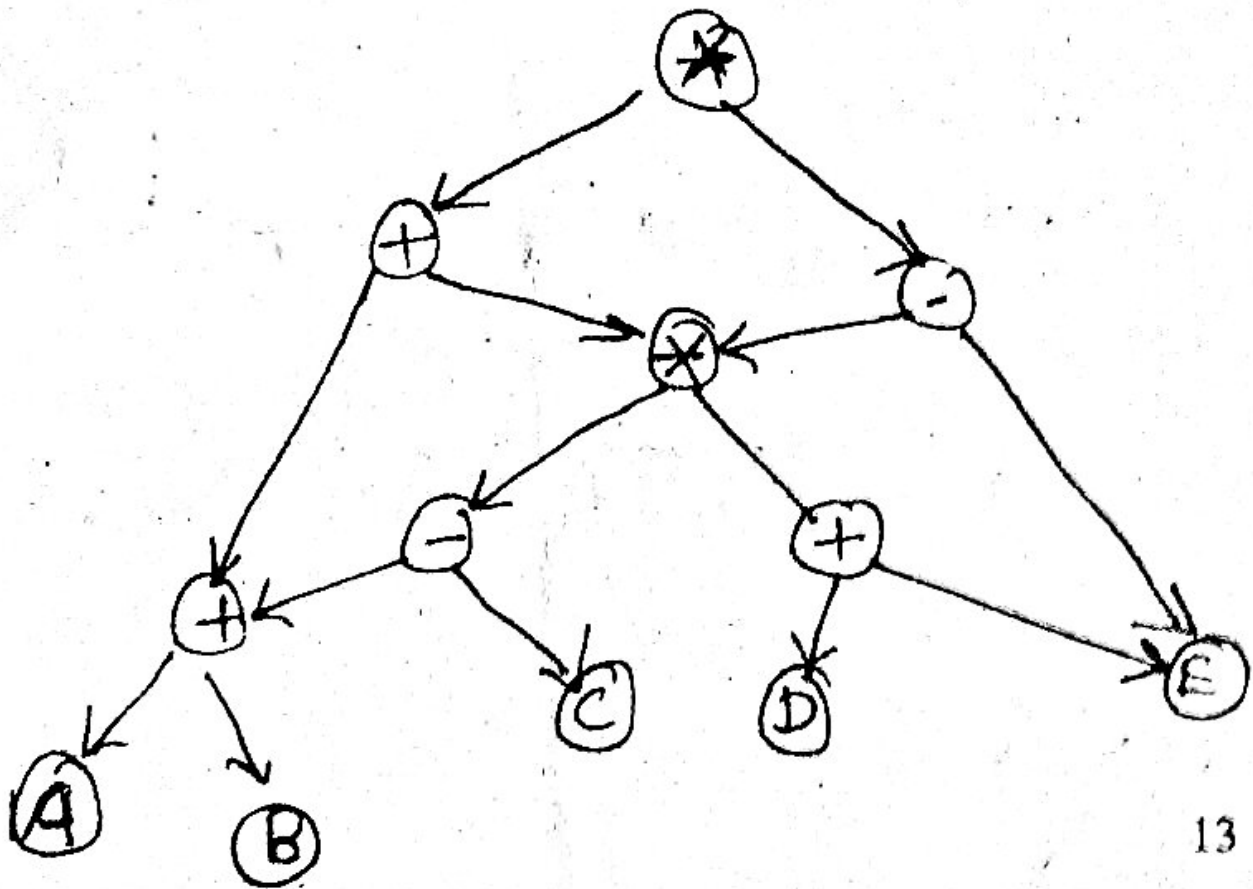
(iii) Loop jamming.

(iv) Loop unrolling.

(iv) Dominator.

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11. State whether the order of computation affect the cost of generated code. If yes find an optimal order of computation for the following DAG. Also explain algorithm used.



OR

12. Explain labelling algorithm to generate machine code from the DAG using suitable example.

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