

**B. E. Sixth Semester (Computer Technology) Examination**

**Course Code : CT 1318 / CT 318 /  
CT 703**

**Course Name : Language Processors**

Time : 3 Hours ]

[Max. Marks : 60

**Instructions to Candidates :—**

- (1) All questions are compulsory.
- (2) All questions carry marks as indicated.
- (3) Due credit will be given to neatness and adequate dimensions.
- (4) Assume suitable data wherever necessary.

**1. Solve any One of the following :—**

- (a) Explain Fast Lexical Analyzer Generator in detail and write a flex program to validate e – mail id.
- (b) Discuss the action taken by every phase of compiler on following source code :

$$A = (B + C) * (D + E)$$

where A, B, C, D and E are the type of integer.

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**2. Solve any One of the following :—**

- (a) Construct LL(1) parsing table for the following grammar :

$$D \rightarrow L : T$$

$$L \rightarrow L, \text{ id } / \text{ id }$$

$$T \rightarrow \text{integer}$$

Also show moves made by this LL(1) parser on input string  
w = integer : id, id.

- (b) Construct predictive parser for the following grammar :

$$E \rightarrow E + T \mid T$$

$$T \rightarrow T * F \mid F$$

$$F \rightarrow \text{id} / (E)$$

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3. Solve any **One** of the following :—

- (a) Obtain LALR parsing table for the grammar and show the stack buffer content for string "id=id" :

$$S \rightarrow L = R / R$$

$$R \rightarrow L$$

$$L \rightarrow * R / id$$

- (b) Obtain CLR parsing table for the grammar and show the stack buffer content for string "acbba" :

$$S \rightarrow SA \mid Ba$$

$$A \rightarrow Ab \mid c$$

$$B \rightarrow aA \mid c$$

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4. Solve any **One** of the following :—

- (a) Consider the following expression NOT (a < b AND (e > f OR i < j)) write suitable grammar, translation scheme, three address code and annotated parse tree.

- (b) Translate the following assignment statement to intermediate code :

$$A[I, J] = B[I, J] + C[A[K, L]]$$

Where bpw = 2

A is 2D of size 10 \* 10

B is 2D of size 10 \* 10

C is 1D of size 20

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5. Solve any **Two** of the following :—

- (a) Explain phrase level error recovery method for LL parser by taking an example. 7.5
- (b) Describe the data structure for symbol table and compare them. 7.5
- (c) What is an activation record ? Explain the meaning of each entry in activation record. 7.5

6. Solve any **Two** of the following :—

- (a) What are data flow equations ? Using algorithm to compute IN and OUT find the computation of IN and OUT. Program illustrating definitions is as given below :

```
{
    int i, sum ;
    sum = 0 ;
    for (i = 0 ; i <= n ; i++)
    {
        sum = sum + a[i] ;
    }
    return sum ;
}
```

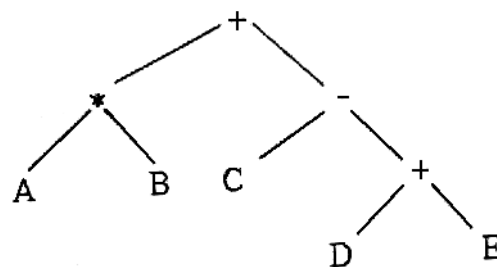
7.5

- (b) Apply different code optimization techniques and get equivalent optimized code :

```
PROD = 0
I = 1
do
    PROD = PROD + A[I] * B[I]
    I = I + 1
End
While I <= 20
```

7.5

- (c) Label the following tree by labeling algorithm and determine the number of register required :



7.5