

**B. E. Sixth Semester (Computer Technology) / SoE – 2014 – 15
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.

1. Solve any One :—

- (A) Discuss the various phases of compiler with the help of following example.
$$z = (a + b) * (c / d)$$
7
- (B) Discuss the role of Context Free Grammar in Syntax Analysis, in brief.
7

2. Solve any One :—

- (A) Test whether the following grammar is LL(1) or not
$$\begin{aligned} S &\rightarrow aBDh \\ B &\rightarrow cC \\ C &\rightarrow bC \mid \epsilon \\ D &\rightarrow EF \\ E &\rightarrow g \mid \epsilon \\ F &\rightarrow f \mid \epsilon \end{aligned}$$
8
- (B) Construct a predictive parsing table for the following grammar, where 'S' is start symbol.
$$\begin{aligned} S &\rightarrow iEtSY \mid a \\ Y &\rightarrow eS \mid \epsilon \\ E &\rightarrow b \end{aligned}$$
8

3. Solve any **One** :—

- (A) Construct SLR parsing table for the following grammar, also show the string parsing for the given input string "i j n n j"

Grammar :

$$X \rightarrow i X Y j \mid j Y$$

$$Y \rightarrow k Y \mid m X \mid Z$$

$$Z \rightarrow Z n \mid n$$

8

- (B) Construct LALR parsing table for the following grammar.

$$S \rightarrow a A D \mid b B d \mid a B e \mid b A e$$

$$A \rightarrow c$$

$$B \rightarrow c$$

8

4. Solve any **One** :—

- (A) Generate three address code for the given *switch – case* statement.

switch (a + b)

begin

case 5 : switch (p + q)

begin

case 0 : a = b + 1 ;

case 1 : a = b + 3 ;

end

case 3 : x = y – 1 ;

default : x = y + 1 ;

end

7

- (B) Generate three address code for the given *ARRAY REFERENCE* statement.

$D = a[b[i, j], k] + b[a[i, j], k]$ where 'a' and 'b' are array of 20×20 , bpw = 4

7

5. Solve any **Two** :—

- (A) Draw the format of Activation Record in Stack Allocation and explain each field in it. 7.5

- (B) Explain Automatic error recovery in YACC and Panic Mode Recovery. 7.5

- (C) Explain error recovery from Semantic Errors, with example. 7.5

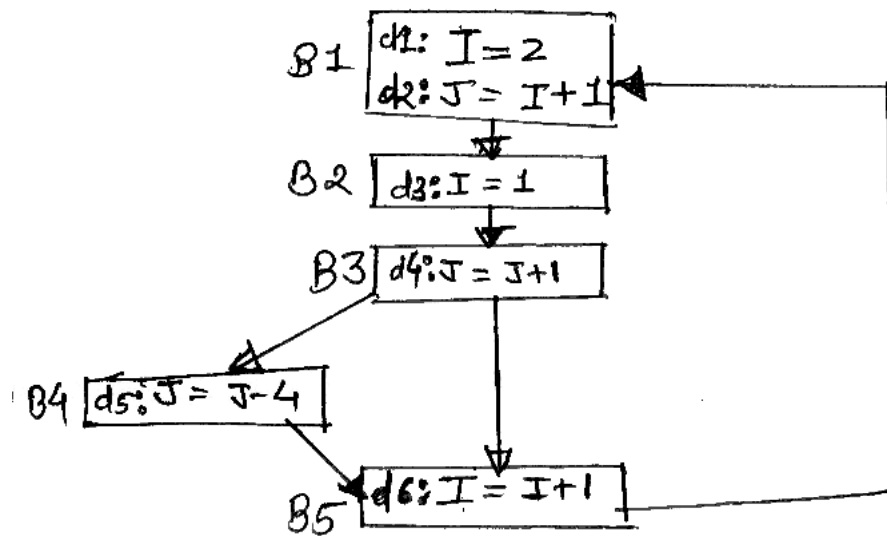
6. Solve any **Two** :—

(A) Explain the following code optimization technique with example.

- (i) Common sub expressions elimination
- (ii) Strength reduction
- (iii) Code movement
- (iv) Loop invariant computation.

7.5

(B) Compute in and out for the following data flow graph :



7.5

(C) Discuss and apply the Labelling algorithm with the help of following three address code :

t1 = a + b
t2 = c + d
t3 = t1 + t2

7.5