V - 1038

CS – 604

Printed Pages : 4

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1038 Roll No.

B. Tech.

(SEM. VI) EXAMINATION, 2006-07

COMPILER CONSTRUCTION

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt all questions.

1 Attempt any **four** parts of the following : **5x4=20**

(a) Discuss how YACC can be used to generate a parser. Also, explain the format of its input specification file.

(b) Prove that regular sets are closed under intersection. Present a method for constructing a DFA with an intersection of two regular sets.

(c) Construct a finite automata that will accept those strings of a binary number that are divisibe by three.

(d) Find the DFA recognizing the language described by the regular expression.

$a|abb|a^*b^+$

(e) Find the reduced grammar that is equivalent to the CFG given below :

$S \rightarrow aC \mid SB$

$A \rightarrow bSCa$

$B \rightarrow aSB \mid bBC$

$C \rightarrow aBC \mid ad$

(f) What is the language accepted by the finite automata whose transition diagram is given below : **(Fig. 1)**.

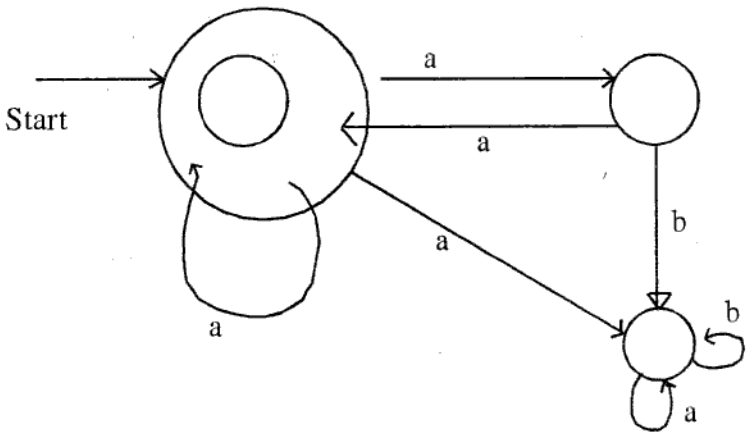

Fig. 1

2 Attempt any **two** parts of the following : **10x2=20**

(a) Construct the LALR passing table for the following grammar :

$S \rightarrow AA$

$A \rightarrow aA \mid b$

(b) Construct a predictive parsing table for the following grammar where S| is a start symbols and # is the end marker.

$S \mid\!\rightarrow S\#$

$S \rightarrow qABC$

$A \rightarrow a \mid bbD$

$B \rightarrow a \mid \in$

$C \rightarrow b \mid \in$

$D \rightarrow c \mid \in$

(c) Consider the grammar and test whether the grammar is LL(1) or not.

$S \rightarrow |AB| \in$

$A \rightarrow |AC|OC$

$B \rightarrow OS$

$C \rightarrow 1$

3 Attempt any **two** parts of the following : **10x2=20**

(a) Generate three address code for the following code :

switch $a + b$

{

case 1 : $x = x + 1$

case 2 : $y = y + 2$

case 3 : $z = z + 3$

default : $c = c - 1$

}

(b) Construct an SLR(1) parsing table for the following grammar :

$S \rightarrow A)$

$A \rightarrow A, P) (P, P$

$P \rightarrow \{\text{num, num}\}$

(c) Transform the following NFA into an optimal/minimal state DFA :

	0	1	$\in$
A	A, C	B	D
B	B	D	C
C	C	A, C	D
D	D	A	–

4 Attempt any **two** parts of the following : **10x2=20**

(a) Write the syntax directed translation to go along with the LR parser for the following:

$S \rightarrow AE$

$A \rightarrow DS$ **while**

$D \rightarrow$ **do**

(b) For the grammar having productions :

$A \rightarrow (A)A \mid \in$

Compute FIRST and FOLLOW set of A.

(c) A relation R on the set of integers defined as :

$R = \{(a, b) \mid a - b$ **is even integer**$\}$

Show that R is equivalence.

5 Attempt any **two** parts of the following : **10x2=20**

(a) Give three-address code for the following code fragment :

```
if   a < b  then
     while  c > d  do
     x = x + y
else
     do
          p = p + q
     while  e <= f
```

(b) Construct an LALR(1) parsing table for the following grammar :

$D \rightarrow L : T$

$L \rightarrow L, id \mid id$

$T \rightarrow$ **integer**

(c) Write a short note on code optimization.