*Total no. of Pages 02*

*Roll no..2K21/SC/*

**Sixth Semester**

**B.Tech.**

**End Semester Examination**

**May-2024**

## SE306 COMPILER DESIGN

***Time: 3:00 Hours*** ***Max. Marks: 50***

**Note:** Answer **ANY FIVE** questions. All questions carry equal marks.
Assume suitable missing data, if any.

1 a) Draw a DFA for the language accepting strings ending with 'abba' over input alphabets $\Sigma = \{a, b\}$ [5][CO

b) Consider the following C code snippet: Calculate the total number of tokens and lexemes. [5][CO

```
#include <stdio.h>
int main() {
int num1 = 10;
int num2 = 20;
int sum = num1 + num2;
printf("The sum is: %d\n", sum);
return 0;
}
```

2 a) Construct pushdown automata for the following language. [5][CO

$$\{a^i b^j c^k \mid i, j, k \in \mathbb{N}, i + k = j\}$$

b) What are various Code Optimization techniques? Explain with example. [5][CO

3 a) Enlist types of parameter passing techniques. If the programming language uses dynamic sco and call by name parameter passing mechanism, the values printed by the below program are : [5][CO

```
global int i = 100, j = 5;
void P(x)
{
int i = 10;
print(x + 10);
i = 200;
j = 20;
print(x);
}
main()
{
P(i + j);
}
```

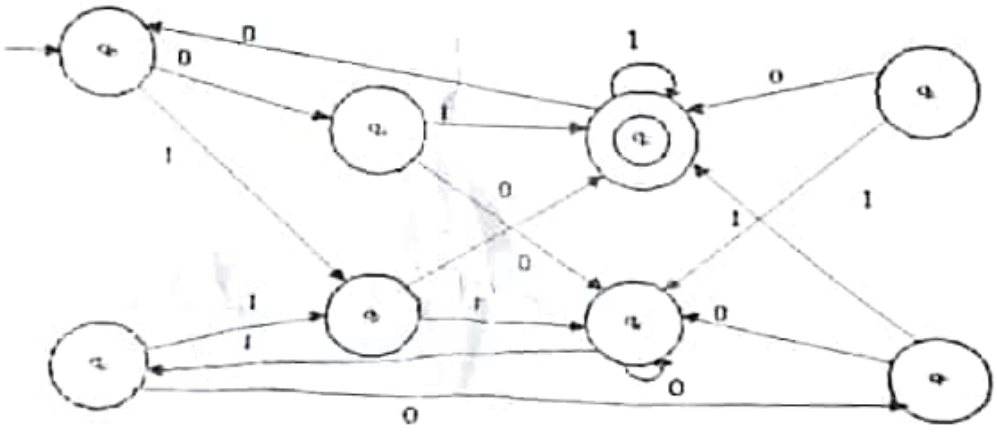
b) What is left factoring , how to remove it ? Remove Left factoring from the following grammar **[5][CO5]**

S→ abA / abB
A→ a
B→ b

**4.** Write steps of CLR parsing. Construct a CLR parsing table and DFA for the given context-free grammar **[10] [CO2]**

S-->AA
A-->aA|b

**5.** Construct a minimum state automata and transition table equivalent to the finite automata given. Write all the steps involve in it. **[10][CO1]**



**6.** What is SDT? Consider the following grammar and their syntax Directed Translation (SDT) rules. Draw the SDT tree with steps and find the value of the expression 4•6+3•7 . **[10] [CO3]**

$S \rightarrow S * A$ {S.val = S.val × A.val}  $S \rightarrow A$ {S.val = A.val}

$A \rightarrow A + B$ {A.val = A.val - B.val}  $B \rightarrow (S)$ {B.val = 2}

$A \rightarrow B$ {A.val = B.val}  $B \rightarrow id$ {B.val = id.val}