

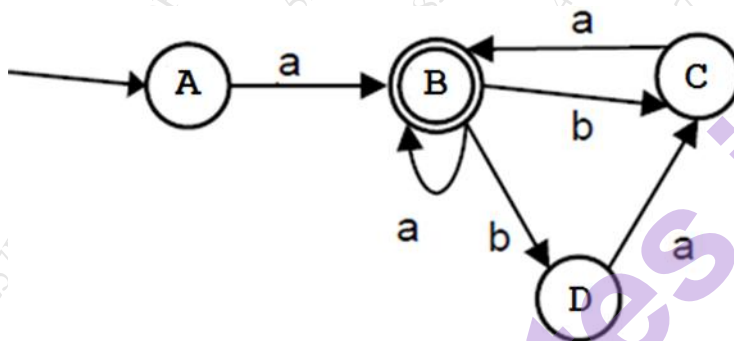
(Time :1 Hours)

[Total Marks: 25].

- N.B:**
- (1) All questions are compulsory.
 - (2) Figures to the **right** indicate full marks.
 - (3) **Assume additional data if necessary** but state the same clearly.
 - (4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.

Q.1 Attempt any two of the following (10)

- a) Write algorithm for conversion of N DFA to DFA and convert the following N DFA to DFA 05



- b) Compare between top-down and bottom-up parsing. Consider a simple grammar given it recognizes strings containing number of a 's followed by at least one b 05

$$S \rightarrow AC$$

$$A \rightarrow aA \mid \epsilon$$

$$C \rightarrow b \mid bC$$

Generate the top-down derivation for the string $aaab$.

- c) Compute FIRST and FOLLOW for the following production 05

$$E \rightarrow TE$$

$$E' \rightarrow +TE'$$

$$E \rightarrow \lambda$$

$$T \rightarrow FT'$$

$$T \rightarrow *FT'$$

$$T' \rightarrow \lambda$$

$$F \rightarrow (E)$$

$$F \rightarrow id$$

- d) $A \rightarrow C$ 05

$$A \rightarrow (A * C)$$

$$C \rightarrow 0$$

1) Is G LL (1) justify?

2) Prepare Predictive Parsing table for G.

3) Parse the string $(0 * 0)$

Q.2 Attempt any two of the following **(10)**

a) Apply Loop Optimization Technique on the given Three Address Code **05**

- 1) a=10
- 2) B=1
- 3) C=7*b
- 4) D= A-4
- 5) E= D *5
- 6) B= B*2
- 7) if B <=10 go to 3
- 8) go to 8

b) Translate the following expression into Quadruples, Triples, Three-address code. **05**

- 1) (a+b)*(c+d)+(a+b+c)
- 2) A+(b*c)/(-b*-c+d)

c) Discuss loop unrolling and loop jamming with suitable example. **05**

d) What is DAG? Draw the DAG for the following expression. **05**

$$(a + a * (b - c)) + ((b - c) * d)$$

Q.3 Attempt any one of the following **(05)**

a) Draw a block diagram of compiler and explain front phases of complier. **05**

b) Explain various notations used in regular expression. Draw the following regular expressions. **05**

- 1. $(a * b) + a * b * b$
- 2. $b * a + a * + a b b *$
