

- (c) 1
(d) 4
- 1-d. CLR parsing is a type of _____ . (CO2) 1
(a) Bottom-Up
(b) Top-Down
(c) Both Bottom-Up and Top-Down
(d) None of above
- 1-e. Type checking is normally done during _____(CO3) 1
(a) Lexical analysis
(b) Syntax Analysis
(c) Syntax directed translation
(d) Code optimization
- 1-f. A parse tree showing the value of attributes at each node is called _____(CO3) 1
(a) Syntax tree
(b) Annotated parse tree
(c) parse tree
(d) All of the above.
- 1-g. Activation Record is a _____ (CO4) 1
(a) Attribute
(b) Non-Contiguous block of memory
(c) Contiguous block of memory
(d) None of above
- 1-h. Missing parenthesis is a _____(CO4) 1
(a) Semantic error
(b) Syntax error
(c) Both Semantic Error and Syntax Error
(d) None of above
- 1-i. Dead code plays no role in any program operation and therefore it can simply be eliminate (CO5) 1
(a) TRUE
(b) FALSE

(c) Can be true or false

(d) Can not say

- 1-j. Code generation can be considered as the _____ .(CO5) 1
- (a) first phase of compilation
 - (b) second phase of compilation
 - (c) third phase of compilation
 - (d) final phase of compilation

2. Attempt all parts:-

- 2.a. Differentiate between Token, Pattern, and Lexeme.(CO1) 2
- 2.b. What is an operator precedence parser? (CO2) 2
- 2.c. Explain S- attribute and L- attribute.(CO3) 2
- 2.d. What are the goals of Error Handler? (CO4) 2
- 2.e. Define DAG with examples.(CO5) 2

SECTION B

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3. Answer any five of the following:-

- 3-a. How to solve the source program to target machine code by using language processing system?(CO1) 6
- 3-b. Classify the concepts of compiler and Interpreter. (CO1) 6
- 3-c. Perform LL(1) parsing to parse string " a+a " by using the following grammar : (CO2) 6
- S->F
S->S+F
F->a
- 3-d. Parse string " ccdd " using given grammar with the help of shift-reduce parsing : (CO2) 6
- S->CC
C->cC
C->d
- 3.e. Consider the following SDTS. (CO3) 6
- E->E+T { E.val = E.val + T.val }
E -> T { E.val = T.val }
T -> T*F { T.val = T.val * F.val }
T -> F { T.val = F.val }
F -> INTLIT { F.val = INTLIT.lexval }
- Using above SDTS, Construct parse tree and annotated parse tree for the given expression "

$$2+3*4 "$$

- 3.f. Draw the format of Activation Record in stack allocation and explain each field in it (CO4) 6
- 3.g. Explain Peephole optimization with various techniques. (CO5) 6

SECTION C

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4. Answer any one of the following:-

- 4-a. Obtain Leftmost and Rightmost derivations for the input string $a+a*a$ using following Production rules- (CO1) 10

$$X \rightarrow X + X$$

$$X \rightarrow X * X$$

$$X \rightarrow a$$

Also draw Parse Tree for the same.

- 4-b. Define the term "Compiler". Explain the different phases of compiler in detail. Write down the output of each phase for the expression $a:=b+c*50$. (CO1) 10

5. Answer any one of the following:-

- 5-a. Construct CLR parsing table for the given grammar (CO2) 10

$$S \rightarrow AA$$

$$A \rightarrow aA$$

$$A \rightarrow b$$

Convert that table into LALR parsing table.

- 5-b. Write the algorithm for FIRST and FOLLOW. Also Find FIRST and FOLLOW sets of given production rules (CO2) 10

$$S \rightarrow aBDh$$

$$B \rightarrow cC$$

$$C \rightarrow bC / \epsilon$$

$$D \rightarrow EF$$

$$E \rightarrow g / \epsilon$$

$$F \rightarrow f / \epsilon$$

6. Answer any one of the following:-

- 6-a. Explain the syntax directed translation scheme and evaluate the expression $(3*5+4)$ using simple Desk calculator. (CO3) 10

- 6-b. Compare between Quadruples , Triples and Indirect Triples. Also Translate the expression $(p + q)*(q + r) + (p + q + r)$ into Quadruples , Triples and Indirect Triples representation. (CO3) 10

7. Answer any one of the following:-

- 7-a. Define Errors and its types with their Error Recovery methods . Explain with example. (CO4) 10
- 7-b. Explain the different Data Structures that can be used to implement Symbol tables.(CO4) 10
8. Answer any one of the following:-
- 8-a. Define the terms basic blocks, flow graphs and loop in flow graph. Generate the basic block and flow-graphs for the following expressions - (CO5) 10
- 1) $r = 1$
 - 2) $c = 1$
 - 3) $t1 = 10 * r$
 - 4) $t2 = t1 + c$
 - 5) $t3 = 8 * t2$
 - 6) $t4 = t3 - 88$
 - 7) $a[t4] = 0.0$
 - 8) $c = c + 1$
 - 9) if $c \leq 10$ goto (3)
 - 10) $r = r + 1$
 - 11) if $r \leq 10$ goto (2)
 - 12) $r = 1$
 - 13) $t5 = c - 1$
 - 14) $t6 = 88 * t5$
 - 15) $a[t6] = 1.0$
 - 16) $r = r + 1$
 - 17) if $r \leq 10$ goto (13)
- 8-b. What is loop optimization? Explain in details about various loop optimization techniques with proper examples.. (CO5) 10