BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(CSE)-AIML-2021/B.Tech.(CSE)-AIML-2022
Course Name – Compiler Design
Course Code - PCC-CSM504
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Cross-compiler is a compiler that describes _____

a) Which is written in a different language from the source language
b) That generates object code for the machine it's running on.
c) Which is written in the same language as the source language
d) That runs on one machine but produces object code for another machine

(ii) Identify the regular expression have all strings of 0's and 1's with no two consecutive 0's is?

a) (0+1)
b) (0+1)*
c) (0+∈) (1+10)*
d) (0+1)* 011

(iii) Select the wrong statement?

a) The language accepted by finite automata are the languages denoted by regular expression
b) Every DFA has a regular expression denoting its language
c) For a regular expression r, there does not exists NDFA with L(R) ant transit that accept
d) None of the mentioned

(iv) Grammars that can be translated to DFAs is _____

a) Left linear grammar
b) Right linear grammar
c) Generic grammar
d) All of the mentioned

(v) The grammar A → AA | (A) | e is not suitable for predictive-parsing because the grammar is judged as?

a) Ambiguous
b) Left recursive
c) Right recursive
d) An operator grammar

(vi) Select the statement to be for true at any valid state in shift-reduce parsing?

a) At the bottom we find the prefixes
b) None of the mentioned
c) Stack contains only viable prefixes
d) Stack consists of viable prefixes

(vii) Choose the situation where Inherited attribute is a natural choice.

a) Tracking declaration of a variable
b) Correct use of L and R values
c) All of the mentioned
d) None of the mentioned

(viii) In a bottom up evaluation of a syntax direction definition, inherited attributes choose to be _____

a) Always be evaluated
b) Be evaluated only if the definition is L – attributed
c) Evaluation only done if the definition has synthesized attributes
d) None of the mentioned

(ix) _____ is sketched as a graph representation of a derivation.

a) The parse tree
b) Oct tree
c) Binary tree
d) None of the mentioned

(x) Dividing a project into segments and smaller units in order to simplify design and programming efforts is cited as _____ .

a) Modular approach
b) Top down approach
c) Bottom up approach
d) Left right approach

(xi) The graph that shows basic blocks and their successor relationship is estimated as _____ .

a) DAG
b) Flow Graph
c) Control Graph
d) Hamilton Graph

(xii) Select the areas that can be accessed by the transfer vector approach of linking?

a) External data segments
b) External sub-routines
c) Data located in other procedure
d) All of the mentioned

(xiii) Output file of the Lex is _____. Given the input file is Sam.

a) sam
b) sam.yy.c
c) sam.lex
d) sam.obj

(xiv) Yacc is available as a command on the _____.

a) MINIX
b) UNIX
c) DOS
d) None of the mentioned

(xv) Yacc semantic action is a sequence of _____.

a) Tokens
b) Expression
c) Statement
d) Rules

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define the following i) Preprocessor ii) Assembler iii) Loader and Linker. (3)
3. Explain the necessary algorithms for FIRST and FOLLOW. (3)
4. Illustrate various error recovery strategies in lexical analysis. (3)
5. Explain the benefits and drawbacks of parser generators (e.g., YACC/Bison) versus manual parsing. (3)
6. Translate the arithmetic expression a*-(b+c) into syntax tree and postfix notation. (3)

OR

Explain syntax tree and DAG from the following expression if x > 0 then x = 3 * (y+ 1) else y = y + 1 (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Estimate the Predictive Parse Table for the grammar E->E+T/T,T->T*F/F,F->(E)|id and parse the string id+id*id. (5)
8. Illustrate Type checking and Type Conversion with examples (5)
9. Explain various method to handle peephole optimization (5)
10. Perform Shift Reduce Parsing for the input string using the grammar. (5)

    S->(L)|a
    L->L,S|S
    a) (a,(a,a))
    b) (a,a)

11. Describe the various phases of a compiler in detail. Also write down the output for the following expression: position: =initial+ rate * 60 (5)

12. Construct CLR parse table for S->L=R/R, R->L, L->*R/id (5)

OR

Construct SLR parsing table for the following grammar: (5)

S → E
E → E + T | T
T → T * F | F

F → id

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