BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(CSE)-2018/B.Tech.(CSE)-2019/B.Tech.(CSE)-2020
Course Name – Compiler Design
Course Code - PCC-CS601
(Semester VI)

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) A parse tree showing the values of attributes at each node is called, choose the correct answer.
   a) Syntax tree
   b) Annotated parse tree
   c) Syntax directed parse tree
   d) Direct acyclic graph

(ii) choose the correct answer for the attribute of the parent node depends on its children, then its attributes are called
   a) TAC
   b) Synthesized
   c) Inherited
   d) Directed

(iii) choose the correct answer for which one of the following is TRUE
   a) + is left associative, while * is right associative
   b) + is right associative, while * is left associative
   c) Both + and * are right associative
   d) Both + and * are left associative

(iv) choose the correct answer for the three address code involves
   a) Exactly three addresses
   b) At most three addresses
   c) No unary operator
   d) None of these

(v) choose the correct answer for the grammar A → AA | (A) | e is not suitable for predictive-parsing because the grammar is?
   a) Ambiguous
   b) Left recursive
   c) Right recursive
   d) An operator grammar

(vi) Select the correct answer for the role of the preprocessor is
   a) produce input to compilers
   b) produce output data
   c) produce output to compilers
   d) None of these

(vii) Select the correct answer for the set of all strings over ∑ ={a,b} in which a single a is followed by any number of b's a single b followed by any number of a's is
   a) ab* + ba*
   b) ab*ba*
   c) a*b + b*a
   d) None of these

(viii) Select the correct answer for the grammar E→E+E | a suffers

a) Left factoring
b) Left recursion
c) Both a and b
d) None of these

(ix) Identify the correct type of the given grammar? S → SS S → λ S → aSb S → bSa

a) Linear
b) Nonlinear
c) Linear & Nonlinear
d) None of the mentioned

(x) Identify the correct type of the given grammar? S → Aa A → Aab | λ

a) Right Linear
b) Left Linear
c) None of the mentioned
d) Right & Left Linear

(xi) Select which of the following is the most general phase structured grammar.

a) Context sensitive
b) Regular
c) Context free
d) All of these

(xii) select the correct answer for the objective of peephole optimization is

a) To improve performance
b) To reduce memory footprint
c) To reduce code size
d) All of these

(xiii) select the correct answer for which data structure is mainly used during shift-reduce parsing?

a) pointers
b) arrays
c) stacks
d) queues

(xiv) select the correct answer for the optimization which avoids test at every iteration is

a) loop unrolling
b) loop jamming
c) constant folding
d) None of these

(xv) Select the correct output of lexical analyzer?

a) A parse tree
b) A list of tokens
c) Intermediate code
d) Machine code

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the operator precedence parser (3)
3. State the necessary algorithms for FIRST and FOLLOW (3)
4. Explain Syntax-directed translation (3)
5. Illustrate an annotated parse tree for the string "3 + 2 – 4" using the grammar E → E + T | E – T | T T → 0|1|2|....|9| (3)
6. Write the importance of 'regular expressions'. (3)

OR

Write Short note on parser generator (YACC). (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Summarize the applications of DAG. (5)
8. Describe the various phases of a compiler in detail. Also write down the output for the following expression: position: =initial + rate * 60 (5)
9. Describe in brief about equivalence of type expressions with examples (5)
10. Explain loop optimization with suitable example. (5)
11. Explain the simple code generator and generate target code sequence for the following statement d:=(a-b)+(a-c)+(a-c) (5)
12. Write the method of generating syntax directed definition for control Statements. (5)

OR

Write with an example to generate the intermediate code for the flow of control Statements (5)

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