



## BRAINWARE UNIVERSITY

### Term End Examination 2020 - 21

Programme – Bachelor of Technology in Computer Science & Engineering

Course Name – Compiler Design

Course Code - BCSE505

Semester / Year - Semester V

Time allotted : 85 Minutes

Full Marks : 70

[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 70=70

1. (Answer any Seventy)

(i) Compiler can not check \_\_\_\_\_ error

- |            |                            |
|------------|----------------------------|
| a) Syntax  | b) Content                 |
| c) Logical | d) Both Syntax and Content |

(ii) Compiler translates the source code to

- |                    |                                      |
|--------------------|--------------------------------------|
| a) Executable code | b) Machine code                      |
| c) Binary code     | d) Both Machine code and Binary code |

(iii) Which of the following groups is/are token together into semantic structures?

- |                     |                                 |
|---------------------|---------------------------------|
| a) Syntax analyzer  | b) Intermediate code generation |
| c) Lexical analyzer | d) Semantic analyzer            |

(iv) Compiler should report the presence of \_\_\_\_\_ in the source program, in translation process.

- |            |            |
|------------|------------|
| a) Classes | b) Objects |
| c) Errors  | d) Text    |

(v) What is the output of lexical analyzer?

- |                 |                     |
|-----------------|---------------------|
| a) A parse tree | b) A list of tokens |
|-----------------|---------------------|

c) Intermediate code

d) Machine code

(vi) How many parts of compiler are there?

a) 1

b) 2

c) 4

d) 8

(vii) Compiler translate the source code to

a) Machine code

b) Binary code

c) Both Machine code and Binary code

d) Executable code

(viii) The regular expression  $1^*(01^*01^*)^*$  denotes

a) set of all strings of 0's and 1's

b) set of all strings of 0's and 1's with even number of 0's

c) set of all strings of 0's and 1's with odd number of 1's

d) none of these

(ix) The regular expression  $(0+1)^*1(0+1)^4$  denotes

a) set of all strings of 0's and 1's

b) set of all strings of 0's and 1's containing at most one 1

c) set of all strings of 0's and 1's whose fifth symbol from right end is 1

d) none of these

(x) The regular expression  $a^+ = ?$

a)  $\{a,aa,aaa,\dots\}$

b)  $\{\epsilon,a,aa,aaa,\dots\}$

c)  $\{\epsilon,a\}$

d) None of these

(xi) Regular expressions are used to represent which language

a) Recursive language

b) Recursive language

c) Regular language

d) None of these

(xii) The set of all strings over  $\Sigma = \{a,b\}$  in which all strings having bbbb as

substring is

- a)  $(a+b)^* bbbb (a+b)^*$
- b)  $(a+b)^* bb (a+b)^* bb$
- c)  $bbb(a+b)^*$
- d)  $bb (a+b)^*$

(xiii) The set of all strings over  $\Sigma = \{a,b\}$  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

(xiv) The following functions are used to convert NFA to DFA using subset construction method

- a)  $\epsilon$ -closure
- b) move
- c) both  $\epsilon$ -closure and move
- d) none of these

(xv) The grammar  $E \rightarrow E+E \mid a$  suffers

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

(xvi) YACC builds up

- a) SLR parsing table
- b) LALR parsing table
- c) Canonical LR parsing table
- d) None of these

(xvii) The edges in flow graph whose heads dominate their tails are called

- a) Back edges
- b) Front edges
- c) Flow edges
- d) None of these

(xviii) The left recursion produces

- a) infinite loop
- b) ambiguity
- c) no problem at all
- d) None of these

(xix) White spaces and tabs are removed in

- a) Lexical analysis
- b) Syntax analysis
- c) Semantic analysis
- d) None of these

(xx) If the attribute of the parent node depends on its children, then its attributes are called

- a) TAC
- b) Synthesized
- c) Inherited
- d) Directed

(xxi) Which of the following is the most powerful parser?

- a) SLR
- b) LALR
- c) CLR
- d) Operator precedence

(xxii) What is a process of finding a parse tree for a string of tokens

- a) Parsing
- b) Analysing
- c) Recognizing
- d) Tokenizing

(xxiii) Compiler can check \_\_\_\_\_ error.

- a) Logical
- b) Syntax
- c) Content
- d) Both Logical and Syntax

(xxiv) The regular expression representing the set of all strings over (x,y) ending with xx beginning with y is

- a)  $xx(x+y)^*y$
- b)  $y(x+y)^*xx$
- c)  $yy(x+y)^*x$
- d)  $y(xy)^*xx$

(xxv) A grammar that produces more than one parse tree for some sentence is called as

- a) Ambiguous
- b) Unambiguous
- c) Regular
- d) All of these

(xxvi) What is considered as a sequence of characters in a token.

- a) Texeme
- b) Pattern
- c) Lexeme
- d) Mexeme

(xxvii) What is a software utility that translates code written in higher language into a low level language.

- a) Converter
- b) Compiler
- c) Text editor
- d) Code optimizer

(xxviii) Which of the following suffices to convert an arbitrary CFG to an LL(1) grammar?

- a) Removing left Recursive alone
- b) Factoring the grammar alone
- c) Along with removing left recursion we also perform the factoring of the grammar
- d) None of the mentioned

(xxix) The grammar  $S \rightarrow ab$  is given. FOLLOW(S)=?

- a) {a}
- b) {b}
- c) {\$}
- d) {a,\$}

(xxx) Which of the following identity is true?

- a)  $\epsilon + RR^* = R^* = \epsilon + R^*R$
- b)  $(R_1R_2)^*R_1 = R_1(R_2R_1)^*$
- c)  $R^*R^* = R^*$
- d) All of these

(xxxii) The problem of LR(0) parser is

- a) Only shift-reduce conflict
- b) Only reduce-reduce conflict
- c) Both Only shift-reduce conflict and Only reduce-reduce conflict
- d) None of these

(xxxiii)  $\epsilon$  never contains in

- a) FIRST
- b) FOLLOW
- c) Both FIRST and FOLLOW
- d) None of these

(xxxiii) Which of the following derivations does a top-down parser use while parsing an input string?

- a) Leftmost derivation
- b) Leftmost derivation in reverse
- c) Rightmost derivation
- d) Rightmost derivation in reverse

(xxxiv) Parsing(top down or bottom up) is not possible if the grammar is

- a) ambiguous
- b) left recursive
- c) left factored
- d) none of these

(xxxv) Lexical analysis is about breaking a sequence of characters into

- a) Groups
- b) Packets
- c) Lines
- d) Tokens

(xxxvi) In a bottom-up evaluation of a syntax directed definition its inherited attributes can do which of the following?

- a) Always evaluated
- b) Can be evaluated if the definition is L attributed
- c) Can be evaluated if the definition has synthesized attributes
- d) Never be evaluated

(xxxvii) The regular expression  $a^*$  =?

- a)  $\{a,aa,aaa,\dots\}$
- b)  $\{a,aa,aaa,\dots\}$
- c)  $\{\epsilon,a\}$
- d) None of these

(xxxviii) The lexical analyzer uses \_\_\_\_\_ to generate token

- a) CFG
- b) Regular expression
- c) Parse tree
- d) None of these

(xxxix) If P, Q, R are three regular expressions and if P does not contain a then the equation  $R = R + RP$  has a unique solution given by

- a)  $R = QP^*$
- b)  $R = P^*Q$

c)  $R = RP$

d) None of these

(xl) The linker

a) is similar to interpreter

b) Uses source code as its input

c) is required to create a load module

d) none of these

(xli) Shift-reduce parsers are

a) top down parser

b) bottom up parser

c) may be top down or bottom up

d) none of these

(xlii) A dangling reference is a

a) pointer pointing to storage which is freed

b) pointer pointing to nothing

c) pointer pointing to storage which is still in use

d) none of these

(xliii) The graph that shows basic blocks and their successor relationship is called

a) DAG

b) Control graph

c) Flow graph

d) None of these

(xliv) Compute E-value for the root of the parse tree for the expression:  $2 \# 3 \& 5 \# 6 \& 4$ .

a) 200

b) 201

c) 160

d) 111

(xlv) Consider a program P that consists of two source modules M1 (contains reference to a function defined in M2) and M2 contained in two different files

a) Edit time

b) Compile time

c) Link time

d) Load time

(xlvi) Which of the following statements is false?

- a) Unambiguous grammar has both kind of derivations      b) An LL(1) parser is a top-down parser
- c) LALR is more powerful than SLR      d) Ambiguous grammar can't be LR(k)

(xlvii) The process of forming tokens from an input stream of characters is called

- a) liberalization      b) characterization
- c) tokenization      d) none of these

(xlviii) The optimization which avoids test at every iteration is

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

(xlix) A basic block can be analyzed by

- a) DAG      b) Flow graph
- c) Graph with cycles      d) None of these

(l) Symbol table can be used for

- a) Checking type compatibility      b) Suppressing duplicate error messages
- c) Storage allocation      d) All of these

(li) Which of the following uses only synthesized attribute?

- a) S-attributed grammar      b) L-attributed grammar
- c) Inherited attribute      d) None of these

(lii) The grammar  $E \rightarrow E + E \mid E * E \mid id$  is

- a) ambiguous      b) unambiguous
- c) not given sufficient information      d) none of these

(liii) The grammar  $S \rightarrow S^1 \mid S^2 \mid ?^1 \mid ?^2$

- a) is left recursive      b) Has common left factor



c) Both is left recursive and Has common left factor      d) Inone of these

(liv) Which of the following is not an intermediate code form?

- a) Quadruples
- b) Triples
- c) Abstract syntax tree
- d) Indirect triples

(lv) The peep-hole optimization is

- a) loop optimization
- b) local optimization
- c) constant folding
- d) data flow analysis

(lvi) A system program that set-up an executable program in main memory ready for execution is

- a) Assembler
- b) Linker
- c) Loader
- d) Text editor

(lvii) A programmer by mistake writes multiplication instead of division, such error can be detected by a/an

- a) Compiler
- b) Interpreter
- c) Compiler or interpreter test
- d) None of the mentioned

(lviii) The computer language generally translated to pseudo-code is

- a) Assembly
- b) Machine
- c) Pascal
- d) FORTRAN

(lix) A system program that combines separately compiled modules of a program into a form suitable for execution is

- a) Assembler
- b) Linking Loader
- c) Cross Compiler
- d) None of the mentioned

(lx) The method which merges the bodies of two loops is

- a) Loop rolling
- b) Loop jamming
- c) Constant folding
- d) None of the mentioned

(lxi) The process manager has to keep track of

- a) Status of each program
- b) Information to a programmer using the system
- c) Both of the mentioned
- d) None of the mentioned

(lxii) Which table is a permanent database that has an entry for each terminal symbol?

- a) Terminal Table
- b) Literal Table
- c) Identifier Table
- d) None of the mentioned

(lxiii) Disadvantage of " Compile and GO " loading scheme is that

- a) Memory is wasted because the case occupied by the assembler is unavailable to the object program
- b) Necessary to translate the users program
- c) It is very difficult to handle multiple segments, even when the source programs are in different languages and to produce orderly modular programs
- d) All of the mentioned

(lxiv) A non relocatable program is the one which

- a) Cannot execute in any area of storage other than the one designated
- b) Consists of a program and information for its relocation
- c) None of the mentioned
- d) All of the mentioned

(lxv)

Consider the grammar

$$E \rightarrow E + n \mid E \times n \mid n$$

For a sentence  $n + n \times n$ , the handles in the right-sentential form of the reduction are

a)

$n, E - n$  and  $E - n \times n$

c)

$n, n + n$  and  $n + n \times n$

b)

$n, E + n$  and  $E + n \times n$

d)

$n, E + n$  and  $E \times n$

(lxvi)

Given the language  $L = \{ab, aa, baa\}$ , which of the following strings are in  $L$ ?

1) abaabaaabaa

2) aaaabaaaa

3) baaaaabaaaab

4) baaaaabaa

a)

1,2,3

c)

1,2,4

b)

2,3,4

d)

1,3,4

(lxvii)

$S \rightarrow CC$

$C \rightarrow cC \mid d$

The grammar is

a)

LL(1)

c)

LALR(1) but not SLR(1)

b)

SLR(1) but not LL(1)

d)

LR(1) but not LALR(1)

(lxviii)

The number of tokens in the following C statement is

```
printf("Hello world");
```

a) 5

c) 7

b) 6

d) 8

(lxix)

$S \rightarrow EE$

$E \rightarrow eE \mid d$

The grammar is

a)

LL(1)

c)

LALR(1) but not SLR(1)

b)

LL(1)

d)

LALR(1) but not SLR(1)

(lxx)

Consider the grammar defined by the following production rules

$S \rightarrow T * P$   
 $T \rightarrow U \mid T * U$   
 $P \rightarrow Q + P \mid Q$   
 $Q \rightarrow \text{Id}$   
 $U \rightarrow \text{Id}$

Which one of the following is TRUE?

a)

+ is left associative, while ? is right associative

c)

Both + and ? are right associative

b)

+ is right associative, while ? is left associative

d)

Both + and ? are left associative

