Total No. of printed pages = 4

**CSE 181601**

12/6/23

Roll No. of candidate | | | | | | | | | | |



**2023**

**B.Tech. 6th Semester End-Term Examination**

**COMPILER DESIGN**

**(New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19))**

Full Marks – 70 Time – Three hours

---

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *Four* from the rest.

1. Answer the following (MCQ) : (10 × 1 = 10)

(i) Which of the following error can a compiler check?

(a) Syntax Error

(b) Logical Error

(c) Both Logical and Syntax Error

(d) Compiler cannot check errors

(ii) Which of the following is known as a compiler for a high-level language that runs on one machine and produces code for a different machine?

(a) Cross compiler

(b) Multipass compiler

(c) Optimizing compiler

(d) One pass compiler

(iii) The symbol table implementation is based on the property of locality of reference is

(a) linear list

(b) search tree

(c) hash table

(d) self-organization list

[Turn over

(iv) Which of the following is a system program that integrates a program's individually compiled modules into a form that can be executed?

(a) Interpreter

(b) Assembler

(c) Compiler

(d) Linking Loader

(v) YACC builds up

(a) SLR parsing table

(b) Canonical LR parsing table

(c) LALR parsing table

(d) None of these

(vi) A bottom up parser generates ————

(a) Right most derivation

(b) Right most derivation in reverse

(c) Leftmost derivation

(d) Leftmost derivation in reverse

(vii) The grammar $A \rightarrow AA \mid (A) \mid \varepsilon$ is not suitable for predictive-parsing because the grammar is ————

(a) Ambiguous

(b) Left-recursive

(c) Right-recursive

(d) An operator-grammar



(viii) Which of the following strings is not generated by the following grammar?

$S \rightarrow SaSbS \mid \varepsilon$

(a) aabb

(b) abab

(c) aababb

(d) aaabbb

(ix) Which of the following functions is performed by loader?

(a) Allocate memory for the programs and resolve symbolic references between objects decks

(b) Address dependent locations, such as address constants, to correspond to the allocated space

(c) Physically place the machine instructions and data into memory

(d) All of the mentioned

(x) Which of the following describes a handle (as applicable to LR-parsing) appropriately?

(a) Position where next reduce or shift operation will occur

(b) The next step has use of Non-terminal for reduction

(c) Used for reduction in a coming-up step along with a position in the sentential form where the next shift or reduce operation will occur

(d) Used in the next step for reduction along with a position in the sentential form where the right hand side of the production may be found

2. (a) How to generate object code for $X = Y + Z * 15$ through different phases of compiler? (8)

(b) Apply LR(O) parser and check the validity of the input string "id+id*id" for the given grammar (7)

E->E+T/T

T->T*F/F

F->(E)/id



3. (a) Define Symbol table. Explain about the data structures for Symbol table. (6)

(b) What is an activation record? Explain how it is related with run time storage organization? (9)

4. (a) Compute closure (I) and goto (I) for the grammar (6)

S -> Aa | bAc | Bc | bBa

A->d

B ->d

(b) Explain the various storage allocation strategies. (9)

5. (a) Explain in brief about Synthesized and Inherited Attributes. (6)

(b) Explain the principle sources of optimization. (9)

6. (a) Design DAG for the following three address statements. Considering this DAG as an example, explain the process of code generation from DAG. (9)

$t_1 = a + b$

$t_2 = c + d$

$t_3 = e - t_2$

$t_4 = t_1 - t_3$



(b) What is intermediate code? Translate the expression

(a+b)/(c+d)*(a+b/c)-d into quadruples, triples and indirect triples. (6)

7. Write short notes on: (any *three*) (3 × 5 = 15)

(a) Three address code

(b) Operator precedence parser.

(c) YACC.

(d) Backtracking.