

Marks Scored:

KATHMANDU UNIVERSITY
End Semester Examination [C]
June, 2018

Level : B. E./B.Sc.
Year : III

Course : COMP 301
Semester : I

Exam Roll No. :
Registration No.:

Time: 30 mins.

F. M. : 20

Date JUN: 15 2018

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Tick (✓) the best answer.

1. The first successful high-level language for business was
a. ALGOL 60 b. Fortran c. COBOL d. SIMULA 67
2. The UNIX operating system is written entirely in
a. ALGOL 60 b. Java c. COBOL d. C
3. Having more than one way to accomplish a particular operation is called
a. Feature multiplicity c. Operator overloading
b. Orthogonality d. Abstraction
4. A relatively small set of primitive constructs can be combined in a relatively small number of ways to build the control and data structure of the language is
a. Feature multiplicity c. Operator overloading
b. Orthogonality d. Abstraction
5. Which of the following is the metalanguage for programming language
a. C++ b. BNF c. List d. Structure
6. The entity which generate language is termed as
a. Parse tree b. Sentential form c. Derivation d. Grammar
7. Axiomatic semantics is based on mathematical logic called
a. Modal logic c. Propositional logic
b. Assertions d. Computational logic
8. An ----- is a logical statement that is assumed to be true.
a. Regular language c. Assertions
b. Modal Logic d. Axiom
9. Left recursion not accepted by
a. SLR parser c. Shift-Reduce parser
b. LALR parser d. LL(1) parser
10. Given a CFG
 $S \rightarrow aAS|a, A \rightarrow SbA|SS|ba$
The string produced by above grammar is
a. baabbab c. abbaabbaa
b. aabaabbaa d. aabaabaab

11. The least restrictive precondition that will guarantee the validity of the associated postcondition is
 - a. Weakest Precondition
 - b. Postcondition
 - c. Assertions
 - d. Strong Precondition
12. The process of computing the attribute values of a parse tree is sometime called
 - a. Allocation
 - b. Decorating
 - c. Deallocation
 - d. Reallocation
13. State diagram of the form used for lexical analyzers are representations of a class of mathematical machine called
 - a. Finite Automata
 - b. DFA
 - c. NFA
 - d. Regular Expression
14. Nameless(abstract) memory cells that are allocated and deallocated by explicit run-time instructions specified by the programmer are
 - a. Stack-Dynamic Variable
 - b. Static Variable
 - c. Implicit Heap-Dynamic Variable
 - d. Explicit Heap-Dynamic Variable
15. LR parser uses
 - a. Program only
 - b. Parsing Table only
 - c. Program and parsing table
 - d. Program and parsing algorithm
16. The collection of all variables that are visible in the statement is called
 - a. Static Variable
 - b. Dynamic Variable
 - c. Stack-Dynamic Variable
 - d. Referencing Environment
17. The issue of referencing environment for executing the passed subprogram where the environment of the call statement that enacts the passed subprogram is
 - a. Deep Binding
 - b. Shallow Binding
 - c. Ad Hoc Binding
 - d. Ad Hoc Polymorphism
18. An area of memory that store the attributes of a variable is
 - a. A Descriptor
 - b. A Primitive Data Types
 - c. Register
 - d. Reference Substring
19. A subprogram that has the same name as another subprogram in the same referencing environment is
 - a. Generic Subprogram
 - b. Subprogram Call
 - c. Overloaded Subprogram
 - d. Subprogram Header
20. Recursive-descent parser is an example of
 - a. Bottom-up parsing
 - b. SLR
 - c. Top-down parsing
 - d. RL

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Semester : I
F.M. : 40

SECTION "B"
[6 Q. × 4=24 marks]

Attempt *ANY SIX* questions.

1. What are some features of specific programming languages you know whose rationales are mystery to you?
2. Define attribute grammars. Prove that the following grammar is ambiguous
 $\langle S \rangle \rightarrow \langle A \rangle$
 $\langle A \rangle \rightarrow \langle A \rangle + \langle A \rangle \mid \langle id \rangle$
 $\langle id \rangle \rightarrow a \mid b \mid c$
3. Define lexeme and token. What are three reasons why syntax analyzers are based on grammars?
4. What are the design issues for arrays? How does a decimal value waste memory space?
5. What are the three general characteristics of *subprograms*? Also explain about *subprogram protocol*.
6. What is a *mixed-mode expression*? Also, explain a coercion.
7. Give the definition of *control structure*. Explain about the design issues for *selection structure*.

SECTION "C"
[2 Q. × 8 = 16 marks]

Attempt *ALL* questions.

8. Explain about the reasons for studying concepts of programming language and language evaluation criteria.
9. Define parser? Distinguish between top-down and bottom-up parsers.
Given the following grammar and the right sentential form

$$\begin{aligned} S &\rightarrow AbB \mid bAc \\ A &\rightarrow Ab \mid aBB \\ B &\rightarrow Ac \mid cBb \mid c \\ S &\rightarrow AbB \mid bAc \end{aligned}$$

Draw a parse tree and show the handle for

- i) $aAcccbbc$
- ii) $baBcBbbc$

