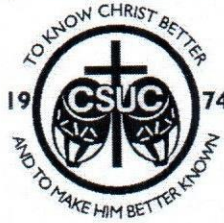


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CHRISTIAN SERVICE UNIVERSITY COLLEGE
KUMASI, GHANA
FACULTY OF HEALTH AND APPLIED SCIENCES
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
BACHELOR OF SCIENCE IN COMPUTER SCIENCE
END OF SECOND SEMESTER EXAMINATIONS – 2020/21 ACADEMIC YEAR

LEVEL 300

CSCP 352: INTRODUCTION TO COMPILERS

MAY 2021

SECTION A (30 Marks)

Time Allowed: 50 Mins

GENERAL INSTRUCTION TO CANDIDATES:

Answer ALL questions.

CIRCLE THE CORRECT ANSWER

1. A(n) _____ is a program that identifies specific words in a stream of characters.
 - a. optimizer
 - b. lexical analyzer
 - c. tokenizer
 - d. recognizer

2. The _____ checks the static semantics of each AST node.
 - a. optimizer
 - b. Scanner
 - c. Type checker
 - d. Symbol table.

3. Pick the odd one out
 - a. Perl
 - b. C++
 - c. Scheme
 - d. APL

4. Pick the odd one out
 - a. Translating IR into target machine code
 - b. Performing membership test
 - c. Reporting errors in a useful way
 - d. Mapping character stream into parts of speech

5. Pick the odd one out:
 - a. Using parse trees for IR
 - b. Translating IR into target machine code
 - c. Deciding which values to keep in registers
 - d. Ensuring conformance with the system's interfaces

6. During _____, IR operations are re-written into target machine operations.
 - a. parsing
 - b. instruction selection
 - c. optimization
 - d. instruction scheduling

7. The _____ attempts to minimise the number of cycles wasted in waiting for operands.
 - a. instruction selector
 - b. optimizer
 - c. instruction scheduler
 - d. parser

8. In the five-tuple finite automaton definition, Σ is the _____.
 - a. union of the edge labels in the transition diagram
 - b. finite set of states
 - c. transition function
 - d. set of accepting states

9. In the five-tuple finite automaton definition, δ is the _____.
- union of the edge labels in the transition diagram
 - finite set of states
 - transition function
 - set of accepting states
10. Concerning procedures, which of the following is incorrect?
- Procedures require system-wide compact
 - Procedures require underlying hardware to support the abstraction
 - Procedures provide shared access to system-wide facilities
 - Procedures establish private contexts
11. All the following are benefits of separate compilation except _____.
- allowing multiple programmers to collaborate
 - keeping run times reasonable
 - allowing programmers to build non-trivial programs
 - allowing the establishment of private contexts
12. The following are all fundamental abstractions of procedures except _____.
- information hiding
 - modified runtime behaviour
 - distinct and seperable name spaces
 - uniform interfaces
13. The arrangement of words and phrases needed to create well-formed sentences in a language is referred to as _____/
- well-formed formula
 - type checking
 - syntax
 - semantics
14. The _____ is the only part in the compiler that touches every character of the input program.
- parser
 - type checker
 - scanner
 - optimizer
15. Labelled arcs in transition diagrams correspond to _____.
- Vertices
 - States
 - Transitions
 - Inputs
16. The _____ converts source code into _____.
- parser, tokens
 - parser, lexemes
 - scanner, lexemes
 - scanner, characters

17. A transition function is also called a _____ function.
- next state
 - accepting state
 - epsilon state
 - initial state
18. The process of associating an operation with a symbol is called _____.
- processing
 - interpretation
 - linking
 - binding
19. In the formalism for recognizers, each state in _____ appears as a double circle in the transition diagram.
- δ
 - S_A
 - S
 - s_0
20. Forcing the parser to recognize high precedence sub-expressions first, is the _____ step in adding precedence.
- First
 - Second
 - Third
 - Fourth
21. Which of the following regular expressions is equivalent to rr^* ?
- r^+
 - $r^?$
 - $r|\epsilon$
 - r^*
22. The vertices of a transition diagram represent the _____ of the DFA.
- Vertices
 - States
 - Transitions
 - Inputs
23. Which of the following denotes a syntax fragment?
- { }
 - []
 - ...
 - %
24. The front end uses parse trees for intermediate representations
- True
 - False

25. A compiler creates a mapping scheme for the languages it works with.
- True
 - False
26. Syntax refers to the arrangement of words and phrases needed to create well-formed sentences in a language.
- True
 - False
27. Interpretation complicates program development.
- True
 - False
28. Interpretation happens before execution.
- True
 - False
29. The scanner converts source code into tokens.
- True
 - False
30. The front end ensures a conformance with the system's interfaces.
- True
 - False
31. The formal structure that connects the front end of the compiler and the back end is largely dependent on the source language.
- True
 - False
32. A translator must preserve the meaning of the program being compiled.
- True
 - False
33. Type checking is dependent on the target machine language.
- True
 - False
34. The optimizer always produces the best possible translation of a program.
- True
 - False
35. For the regular expression r , r^+ is equivalent to r^* .
- True
 - False
36. BNF was created by Peter Backus and John Naur.
- True
 - False

37. Deterministic Finite Automata is single-valued.
a. True
b. False
38. DFAs allow transitions on the empty string.
a. True
b. False
39. Control Abstraction is responsible for providing access to the procedure by names and parameters.
a. True
b. False
40. NFAs allow states that have multiple transitions on the same character.
a. True
b. False
41. The spelling of any word is a regular expression
a. True
b. False
42. Scanning is the second state of a three-part process that the compiler uses to understand the input program
a. True
b. False
43. During scanning, the parser assigns a syntactic category to each valid word.
a. True
b. False
44. A finite automaton is a formalism for recognizers that has an infinite set of states.
a. True
b. False
45. A compiler must necessarily understand the rules that govern syntax and meaning of the output language.
a. True
b. False
46. Any DFA is also a NFA.
a. True
b. False
47. The naming abstraction ensures that there are well-defined entries and exits.
a. True
b. False

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FILL IN WITH THE CORRECT ANSWERS

48. A compiler must understand the form, syntax, content and _____ of the input language.
49. A(n) _____ takes an executable specification as input and produces the result of executing that specification.
50. During interpretation, decisions are made at _____ time.
51. During compilation, decisions are made at _____ time.
52. In compiler theory, an atomic unit of a language is called a _____.
53. A(n) _____ allows information to be associated with identifiers and shared among compiler phases.
54. For regular expressions r and s , $r | s$ is termed as _____.
55. For regular expression r , r^* is termed as _____.
56. To eliminate ambiguity, parenthesis have the highest precedence, followed by _____.
57. The _____ takes an IT as input and produces a semantically equivalent IR as its output.
58. For regular expressions r and s , rs is termed as _____.
59. If a grammar has more than one leftmost derivation for a single sentential form, the grammar is said to be _____.
60. What does the regular expression ***Letter (Letter | Digit)**** represent?