

Addis Ababa University
Department of Computer Science
Model EXIT Exam 2025

Computer Programming

1. What are the values of A, B, C and D after executing the following C++ code fragment?

```
A = 5, B = 9;  
C = ++A - B;  
D = C + B--;  
cout<<A<<B<<C<<D;
```

- A. 5, 9, -4, 0
- B. 6, 8, -3, 6
- C. 6, 9, -3, 5
- D. 8, 6, -3, 6

2. What will be the value of count and sum if a user provides 7.2 as the value of x in the below given C++ code?

```
float sum = 3;  
float count = 0;  
if (x < 6.0)  
    sum = sum + x;  
count = (count += 1)* sum;
```

- A. 0, 10.2
- B. 10.2, 10.2
- C. 0, 3
- D. None of the above

3. How many times the message “Hello” will be displayed on the screen if the values of j = 2, k = 5, m= 6, and n = 9?

```
while (j < k){  
    while (m < n){  
        cout<<"Hello";  
        m = m + 1;  
    }  
    j = j + 1;  
}
```

- A. 0
- B. 6
- C. 3
- D. 9

4. Consider the below given C++ code and answer the below question.

```
int x = 3;  
int num[5] = {4, 12, 5, 7};  
int *t, *v;  
t = &x;  
v = num+2;
```

`*(v+4) = *t;`

What does a statement `cout<<*t;` prints?

- A. The address of x
- B. 3
- C. 7
- D. None of the above

5. What will be the output of the code below?

```
struct Person {  
    int age;  
    string name;  
};  
int main() {  
    Person p1{25, "Sami"};  
    Person p2 = p1;  
    p2.age = 30;  
    cout<<p1.age << " "<<p2.age<<endl;  
    return 0;  
}
```

- A. 25 25
- B. 25 30
- C. 30 30
- D. Compilation error
- E. None of the above

6. What will be the output of the below given code?

```
enum Months {  
    Jan=1, Feb, Mar, Apr,  
    May, Jun, Jul, Aug,  
    Sep, Oct, Nov, Dec  
};  
int main(){  
    Months mon;  
    for(mon = Jan; mon < Dec; mon = (Months)(mon+1))  
        mon = (Months)(mon + 1);  
    cout<<mon<<" "  
    return 0;  
}
```

- A. Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
- B. 1 2 3 4 5 6 7 8 9 10 11 12
- C. 12
- D. 13
- E. None of the above

7. Given that the file output stream variable, named fileout, has been defined and opened for output, which of the following will return the current position of the file pointer?

- A. fileout.tellg()
- B. fileout.tellp()
- C. fileout.seekg()
- D. fileout.seekp()
- E. None of the above

Database Systems[1]

8. What is the primary purpose of concurrency control protocols?

- A. To increase transaction speed
- B. To guarantee serializability
- C. To reduce data redundancy
- D. To enhance data security

9. In the context of concurrency control, what is a deadlock?

- A. A situation where two or more transactions are waiting for each other to release locks
- B. A situation where a transaction is unable to acquire a lock because of its busy nature
- C. A situation where a transaction is rolled back due to a conflict execution occurred
- D. A situation where a transaction is committed successfully but rolled back

10. If A1 wants to grant A2 the privilege to insert and delete rows in the EMPLOYEE and DEPARTMENT relations without allowing A2 to propagate these privileges, what command should A1 issue?

- A. GRANT INSERT, DELETE ON EMPLOYEE, DEPARTMENT TO A2 WITH GRANT OPTION.
- B. GRANT INSERT, DELETE ON EMPLOYEE, DEPARTMENT TO A2;
- C. GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A2 WITH REVOKE OPTION;
- D. GRANT UPDATE ON EMPLOYEE, DEPARTMENT TO A2 WITH ALLOW OPTION;

11. Which of the following statements about database recovery strategies is correct?

- A. The "Force" strategy simplifies recovery by ensuring that all cache updates are immediately flushed to disk when a transaction commits.
- B. The "No-Steal" strategy allows cache to be flushed before transaction commits, reducing memory needs but leading to complex recovery.
- C. The "Steal" strategy maintains data integrity by ensuring that cache cannot be flushed before transaction commit.
- D. The "No-Force" strategy reduces I/O cost by allowing updated pages of a committed transaction to remain in the buffer when another transaction needs to update them.

12. What is the impact of larger data item size (coarse granularity) on concurrency?

- A. It increases the degree of concurrency permitted
- B. It eliminates the need for locks
- C. It reduces the degree of concurrency permitted
- D. It has no impact on concurrency

13. What must be obtained before performing a deletion operation on an existing data item?

- A. Shared lock
- B. Intention lock
- C. Write lock
- D. Read lock

14. Which type of backup copies only the data that has changed since the last backup?

- A. Full Backup
- B. Incremental Backup
- C. Differential Backup
- D. Snapshot Backup

15. What is the primary purpose of database recovery?

- A. To increase transaction speed and performance
- B. To reduce data redundancy and save storage
- C. To enhance data security and prevent failure
- D. To bring the database into the last consistent state

16. What is the primary notion of Role-Based Access Control (RBAC)?

- A. Permissions are associated with individual users, and roles created per user
- B. Permissions are associated with roles, and users are assigned to appropriate roles.
- C. Permissions are granted based on user requests and administrative approvals
- D. Permissions are automatically assigned by the system for each user

17. Which principle of data integrity states that all data must be recorded at the time an action is performed, not retroactively?

- A. Contemporaneous
- B. Attributable
- C. Legible
- D. Original

18. If the owner account A revokes the privilege granted to B, what happens to the privileges that B propagated based on that privilege?

- A. They remain active.
- B. They are automatically revoked by the system.
- C. They are transferred to another account.
- D. They are converted to read-only privileges.

19. In nested transactions, what is the purpose of using savepoints?

- A. To encrypt data during transmission
- B. To create roll back points in case of error
- C. To compress data to save storage space
- D. To duplicate data for backup purposes

20. Which feature is unique to object-oriented databases compared to relational databases?

- A. Use SQL for data querying.
- B. Ability to handle large amounts of data.
- C. Storing data in objects and classes.
- D. Organizing data into rows and columns.

21. What is a key advantage of relational databases over object-oriented databases?

- A. Simple and widespread SQL use.
- B. Compatibility with NoSQL.
- C. Supports complex data types.
- D. Handles hierarchical data.

Object Oriented Programming

22. Which of the following will work if you want to create a table which looks like the following?

12	-9	8
7	14	
-32	-1	0

- A. double[][] table = {12, -9, 8, 7, 14, -32, -1, 0};
- B. double[][] table = {{12, -9, 8}, {7, 14, 0}, {-32, -1, 0}};
- C. double[][], table = {{12, -9, 8}{7, 14}{-32, -1, 0}};
- D. double[][], table = { {12, -9, 8}, {7, 14}, {-32, -1, 0} };

23. Which of the following is a good candidate to be static?

- A. The PI field of a circle class
- B. A method that displays the salary of an Employee class
- C. A method that calculates the hypotenuse of a right-angle triangle class
- D. A name field of a Student class
- E. All except B

24. Here is the general syntax for *method* definition:

```
accessModifier returnType methodName(parameterList ){  
    Java statements  
  
    return returnValue;  
}
```

What is true for the *accessModifier*?

- A. It must always be *private* or *public*.
- B. It can be omitted, but if not omitted it must be *private* or *public*.
- C. It can be omitted, but if not omitted there are several choices, including *private* and *public*
- D. The *access modifier* must agree with the type of the *return value*.
- E. All of the above

25. What is the output of the following Java code?

```
class FinalExam{  
    int num1;  
    public FinalExam() {  
        num1 = 4;  
    }  
    void display() {  
        System.out.println(num1);  
    }  
}  
class Final1 extends FinalExam{  
    int num=3;  
    public Final1() {  
        this(5);  
        num1 = num;  
    }  
    public Final1(int num) {
```

```

        this.num = num * num;
    }
}

public class Main{
    public static void main(String[] args){
        Final1 f = new final1();
        f.display();
    }
}

```

- A. 4
- B. 25
- C. 12
- D. 20

26. Which one of the following is important to implement dynamic Polymorphism?

- A. Polymorphic variable
- B. Method overriding
- C. Inheritance
- D. All of the above

27. What **must** a non-abstract child do about an abstract method in its parent class?

- A. A child must override an abstract method inherited from its parent by defining a method with the same signature and same return type
- B. A child must define an additional method similar to the one inherited from its parent by defining a method with the same signature and different return type.
- C. A child must not define any method with the same signature as the parent's abstract method.
- D. A non-abstract child must define an abstract method with the same signature and same return type as the parent's abstract method.
- E. All of the above

28. Which of the following is true?

- A. A child class can extend a parent or implement an interface, but not do both.
- B. A child class can extend just one parent and can implement just one interface.
- C. A child class can extend just one parent and can implement zero or more interfaces.
- D. A child class can extend zero or more parents, and can implement zero or more interfaces.

Computer organization and Architecture

29. Which of the following best describes the relationship between CPU involvement in programmed I/O, interrupt-driven I/O, and direct memory access (DMA)?

- A. Programmed I/O wastes CPU cycles, interrupt-driven I/O allows the CPU to perform other tasks until an interrupt occurs, and DMA minimizes CPU involvement.
- B. Programmed I/O and interrupt-driven I/O use the same CPU time, and DMA adds extra CPU overhead.
- C. Interrupt-driven I/O wastes more CPU time than programmed I/O, and DMA wastes the most.
- D. All three methods require identical CPU effort during data transfer.

30. A peripheral device uses memory-mapped I/O in a system. Which statement is true about memory-mapped I/O vs. port-mapped I/O?

- A. load/store instructions, whereas port-mapped I/O uses separate I/O instructions and address space.
- B. Memory-mapped I/O uses the same address space as regular memory and uses standard
- C. Port-mapped I/O uses the general memory space and ordinary instructions, while memory- mapped I/O requires special I/O instructions.
- D. In memory-mapped I/O, I/O devices have a separate “I/O pin” on the bus, which is not needed in port-mapped I/O.
- E. Memory-mapped I/O cannot use DMA transfers, while port-mapped I/O can.

31. Which technique allows an I/O device to transfer a block of data to memory without continuous CPU intervention?

- A. Programmed I/O with busy-waiting
- B. Interrupt-driven I/O
- C. Direct Memory Access (DMA)
- D. Polling in a loop

32. Which statement about RISC versus CISC architectures is generally true?

- A. RISC has many complex instructions; CISC has few simple instructions.
- B. RISC executes one instruction per cycle; CISC executes one instruction per clock cycle.
- C. RISC uses a fixed instruction length and simple decoding, while CISC has variable-length instructions and more addressing modes.
- D. RISC requires microcode; CISC does not.

33. What is the main purpose of cache memory in the computer hardware structure?

- A. To permanently store user files.
- B. To buffer data transfers to a printer.
- C. To provide faster access to frequently used data between CPU and main memory.
- D. To store BIOS settings.

Correct Answer: C

34. What is the correct sequence of micro-operations for the fetch phase of an instruction cycle?

- A. PC → MAR, Read; MDR → IR; PC ← PC + 1.
- B. PC → IR, PC ← PC + 1; IR → MAR.
- C. IR → MDR, MDR → PC; MAR ← PC + 1.
- D. MAR → PC; PC → IR; MDR ← PC + 1.

35. In an arithmetic instruction like ADD R1, R2, R3, which registers and operations are involved?

- A. R2 ← R1 + R3 is performed by the Control Unit.
- B. R1 ← R2 + R3 is performed by the ALU using R2 and R3 as inputs and storing result in R1.
- C. Memory is read from address R1 and R2, then written to R3.
- D. The instruction is moved to stack memory.

Data Communication and Computer Networking

36. What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask?

- A. 14
- B. 15
- C. 30
- D. 62

37. Which one of the following is incorrect about Physical Layer?

- A. It interacts with the transmission media, the physical part of the network that connects network components together.
- B. It decides on the number of logical channels for transporting data coming from different sources.
- C. It creates a signal that represents this stream of bits.
- D. It decides on the directions of data flow.
- E. None of the Above

38. Among the given alternatives which one of the following task is not done by data link layer?

- A. Framing
- B. Flow control
- C. Channel coding
- D. Error control
- E. None of the Above

39. Which of the following is valid IP host address given the network id 191.254.0.0 while using 11 bits for subnetting?

- A. 191.254.0.32
- B. 191.254.1.29
- C. 191.254.1.64
- D. 191.254.0.96

40. Among the following what kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences?

- A. Unshielded Twisted Pair cable
- B. Optical Fiber cable
- C. Coaxial cable
- D. Microwave
- E. Copper Cable

41. Which one of the following is not true about class C

- A. Starting with 110 and 21 network number
- B. Three bytes define the netid and one byte defines the hosted
- C. probably too small for many organizations
- D. Two bytes define the netid and two bytes define the hostid
- E. None

42. Addis Ababa university has been assigned the class B network address 165.87.0.0 . The organization needs to divide the network in to eight subnets. what subnet mask should be applied to the network to provide the most hosts per subnet?

- A. 255.255.192.0
- B. 255.255.224.0
- C. 255.255.240.0
- D. 255.255.248.0

Data Structures and Algorithm

43. What is an Abstract Data Type (ADT)?

- A. A physical implementation of a data structure in memory
- B. A mathematical model for data types defined by their behavior and operations
- C. A programming language-specific data type
- D. A hardware-based data storage mechanism

44. Inserting an item into the stack when stack is not full is called _____ operation.and deletion of an item from the stack when the stack is not empty is called-----

- A. Push,pop
- B. Pop,push
- C. Insert delete
- D. Delete,insert

45. ----- is a pile in which items are added at one end and removed from the other end

- A. Stack
- B. Queue
- C. List
- D. None of the above

46. What is the time complexity of the following code snippet?

```
for (int i = 0; i < n; i++) {  
    for (int j = 0; j < n; j++) {  
        // Constant time operation  
    }  
}
```

- A. O(n)
- B. O(n log n)
- C. O(n²)
- D. O(n³)

47. What is the minimum number of nodes in a complete binary tree if the height of the tree is 3?

- A. 12
- B. 9
- C. 8
- D. 13

48. For the expression $(7-(4*5))+(9/3)$ which of the following is its post fix representation?

- A. *745-93/+
- B. 93/+745*-
- C. 745*-93/+
- D. 74*+593/-

49. Which of the following is true?

- A. A graph may contain no edges and many vertices
- B. A graph may contain many edges and one vertex
- C. A graph may contain no edges and no vertices
- D. A graph may contain no vertices and many edges

Web programming

50. What will the following JavaScript function will return?

```
[1,2,3].map(num=>{  
  if(un%2==0)  
    return;  
  return num*2;  
});
```

- A. [2, undefined, 6]
- B. [2, , 6]
- C. [2, undefined, undefined]
- D. [undefined, undefined, undefined]

51. What does the following PHP code snippet will do?

```
$stmt=$coon->prepare("SELECT * FROM users WHERE id=?");  
$stmt->bind_param("I", $id);  
$stmt ->execute();
```

- A. Execute a static query
- B. Fetch all users
- C. Prevent SQL injection
- D. It Will cause an error

52. What is the difference between `visibility: hidden` and `display: none`?

- A. Both remove the element from the document flow
- B. `visibility: hidden` hides the element and removes its space
- C. `display: none` hides the element but keeps its space
- D. `visibility: hidden` hides the element but keeps its space;
- E. `display: none` removes it entirely

53. Which one of the following MySQLi function is used to prevent XSS(Cross-Site Scripting)?

- A. `mysqli_real_escape_string()`
- B. `htmlspecialchars()`
- C. `mysqli_escape_string()`
- D. `xss_escape()`

54. One of the following statements is true about let, const and var?

- A. let and are function scoped
- B. const can be reassigned
- C. var is block scoped
- D. let is block scoped, var is function scoped

55. One of the following selectors has the highest specificity?

- A. .menu .item
- B. #header .menu
- C. div span
- D. ul>li

56. One of the following is an attribute of the <form> element which prevents a form from being validated when submitted?

- A. novalidate
- B. no-validate
- C. validate="false"
- D. skip-validation

Operating system

57. Which of the following is not true about deadlocks?

- A. Deadlocks can be provably avoided by defining a global resource acquisition order.
- B. Deadlocks can ONLY occur if there is a circular wait for resources.
- C. Strict priority schedulers use priority donation to prevent deadlocks.
- D. A program in a safe state can eventually deadlock.
- E. None of the above

58. Among the following which one of the following describes correctly about a "race condition"?

- A. A situation where multiple processes access shared resources concurrently in an unsafe manner
- B. A situation where processes run on different CPUs
- C. A situation where two processes share the same memory space
- D. A situation where processes are in a deadlock

59. Which one of the following statements is *incorrect* statement about device controller?

- A. Works like an interface between a device and a device driver.
- B. Performs error correction if necessary
- C. An interface to convert serial bit stream to block of bytes
- D. software modules that can be plugged into an OS to handle a particular device
- E. None of the above

60. Logical memory is broken into blocks of the same size called _____.

- A. Pages
- B. Frames
- C. Page table
- D. Segmentation
- E. none

61. Which of the following scheduling algorithms is non-preemptive?

- A. Round Robin
- B. SJF
- C. FCFS
- D. Priority Scheduling (preemptive)

62. What is the main advantage of using the Round Robin (RR) scheduling algorithm?

- A. It provides fair allocation of CPU time to all processes
- B. It gives higher priority to CPU-bound processes
- C. It minimizes the average waiting time for processes
- D. It reduces the number of context switches

63. What does the term "swapping" refer to in the context of memory management?

- A. Moving data from the cache to main memory
- B. Moving entire processes between main memory and secondary storage
- C. Shuffling virtual memory pages to reduce page faults
- D. Dynamically resizing memory partitions based on demand

Software Engineering

64. What is the main goal of Software Engineering?

- A. To create software as fast as possible
- B. To write code without documentation
- C. To develop software that is reliable, maintainable, and efficient
- D. To avoid using any standard development process

65. Which of the following best describes a software process model?

- A. A tool used for debugging code
- B. A set of activities and associated results that produce a software product
- C. A process that always execute in the same way in all software project
- D. A programming model used for web applications

66. Which software development model is best suited for projects with well-understood requirements?

- A. Waterfall model
- B. Agile Model
- C. Spiral Model
- D. Incremental Model

Given the following statement that is documented to describe a system, answer the following three questions.

System Description: In a college portal system, instructors are expected to generate grade and then print the grade report so that they can sign on it and submit to the registrar.

67. Which of the following model best represents instructor?

- A. Class
- B. Object
- C. Use case
- D. Actor

68. Which of the following best models the grade report?

- A. Entity class
- B. Boundary class
- C. Control Class
- D. Entity object

69. Which of the following is possible use case?

- A. Grade report
- B. Instructor
- C. Portal
- D. Generate grade

70. A system design should be done based on ...

- A. As-is scenario
- B. Visionary scenario
- C. Control class
- D. As-is use case

71. Which of the following is true about components?

- A. They are deployable product to deliver the service of a subsystem
- B. Cannot be reused from previous system
- C. Should always be purchased from one of the commercially-of-the-shelf (COTS) components.
- D. The are useful for fast development but does not facilitate modularity.

- 72.** When designing a system, what is the role of non-functional requirements (NFRs)?
- A. They define services of the software
 - B. They specify programming languages to be used
 - C. They describe how the system performs under various conditions
 - D. They are not considered in the design phase

Design and analysis of algorithm

- 73.** Which of the following violates the essential characteristics of a valid algorithm?
- A. Produces a result after a finite number of steps
 - B. Accepts zero or more inputs
 - C. Allows for subjective interpretation of steps
 - D. Has clearly defined operations

- 74.** Why do we analyze algorithms?

- A. To check syntax errors
- B. To prove correctness and argue for efficiency
- C. To reduce the lines of code necessary
- D. To determine the behavior of an algorithm

- 75.** What is the RAM model used for in algorithm analysis?

- A. Describing distributed computing
- B. Estimating hardware costs
- C. Modeling memory hierarchy and latency
- D. Defining fundamental operations of a computer

- 76.** What is the major limitation of the Master Theorem?

- A. It cannot be applied if subproblems are of significantly different sizes
- B. It cannot handle recursion trees with a depth greater than $\log n$
- C. It assumes the input size is always a power of two
- D. It gives only best-case complexity, not worst-case

- 77.** Which edge type in DFS traversal indicates a cycle in a graph?

- A. Forward edge
- B. Tree edge
- C. Back edge
- D. Cross edge

- 78.** Which condition makes a problem suitable for dynamic programming?

- A. It involves making the best choice at each step based solely on local information
- B. It can be decomposed into subproblems that recur and share optimal substructure
- C. It can be modeled using a recursion tree where only the leftmost path is considered
- D. It can be divided into independent subproblems with a simple combination step

- 79.** Which of the following best explains how greedy algorithms operate?

- A. They prioritize minimum recursion depth over all other criteria
- B. They explore all combinations before selecting an optimal solution
- C. They choose the best local option in the hope of finding a global optimum
- D. They break problems into overlapping subproblems and reuse solutions

Introduction to Artificial Intelligence

- 80.** What is a rule-based system in the context of expert systems?

- A. A system that applies a set of pre-defined rules to infer conclusions
- B. A system where data is automatically processed
- C. A system that generates rules from data automatically
- D. A system with no predefined knowledge

81. What is the time complexity of the Minimax algorithm without pruning, for a game tree of depth d and branching factor b ?

- A. $O(b + d)$
- B. $O(b^d)$
- C. $O(d^b)$
- D. $O(b * d)$

82. Which of the following is an example of a simple reflex agent?

- A. A self-driving car planning a route
- B. A chatbot giving intelligent replies
- C. A thermostat turning on the heater when temperature is low
- D. A robot learning from experience

83. Which search algorithm is guaranteed to find the optimal solution, if one exists, given uniform step costs?

- A. Breadth-First Search
- B. Depth-First Search
- C. Hill Climbing
- D. Random Search

84. AI, a problem can be solved by searching when:

- A. The solution is hardcoded
- B. The path to the goal is unknown and must be discovered
- C. The system has complete information
- D. The solution is provided by the user

85. In robotic exploration, which of the following search methods is typically preferred?

- A. Depth-First Search
- B. Blind Search
- C. A* Search
- D. Hill Climbing

86. What does the following FOL sentence mean: $\exists x (\text{Dog}(x) \wedge \text{Barks}(x))$?

- A. All dogs bark
- B. No dogs bark
- C. Some dogs don't bark
- D. There is at least one dog that barks

Network and System Administration

87. What is the primary concern in data center management?

- A. Designing websites for optimal performance
- B. Managing power, cooling, and fire safety
- C. Ensuring maximum social media engagement
- D. Monitoring internal network traffic

88. Which of the following is a key principle of system administration?

- A. Installing multiple software on a server
- B. Keeping systems outdated for stability
- C. Automating repetitive tasks
- D. Using manual backup methods

89. What is the first step in the bootstrapping process of an OS?

- A. Loading the OS kernel into memory
- B. Initializing multi-user operations
- C. Configuring network interfaces
- D. Executing system daemons

90. What is the primary function of a shell in UNIX/Linux?

- A. Managing system hardware resources
- B. Serving as a graphical interface for the OS
- C. Interpreting and executing user commands
- D. Connecting remote servers via FTP

91. When does page fault occur?

- A. The page is present in memory.
- B. The deadlock occurs.
- C. The page does not present in memory.
- D. The buffering occurs.

92. If the default gateway is configured incorrectly on a host, what is the impact on communications?

- A. The host is unable to communicate with hosts on remote networks.
- B. The host is unable to communicate on the local network.
- C. The host is unable to communicate with hosts on both the local and remote networks.
- E. The host cannot get an IP address from the DHCP server.

93. What is the primary purpose of log rotation in system administration?

- A. To delete all logs automatically after a fixed time periods
- B. To increase system performance by disabling logging features
- C. To Prevents storage overflow and keeps records organized
- D. To randomly rename log files without archiving

Automata and Complexity Theory

94. When will an input be accepted by a Turing Machine?

- A. If it reaches any state and has no possible move for an input symbol
- B. If the machine consumes all the input symbols in one of the states
- C. If the machine halts in a final state
- D. If the machine enters into an infinite loop

95. Which one of the following could be modeled using Turing Machine?

- A. Non-Recursively Enumerable Languages
- B. Non-Deterministic Finite Automata
- C. Push Down Automata
- D. Deterministic Finite Automata

96. Which of the following is an incorrect statement?

- A. All recursive languages are recursively enumerable
- B. All recognizable languages are decidable
- C. All recursively enumerable languages are recursive
- D. Decidable problems can't be modeled by a Turing Machine

97. Which one of the following statements is correct?

- A. Nondeterministic FSA have memory
- B. Turing Machine have an infinite memory
- C. Deterministic FSA have memory
- D. Push-down Automata have unrestricted memory

98. When can we say two grammars are equivalent?

- A. When the languages represented by both grammars are the same
- B. When the language derived from one of the grammars become the subset of the other
- C. When the alphabets of the two grammars are the same
- D. When a single string is member of the language represented by both grammars

99. Which one of the following is a regular language?

- A. Strings whose length is a sequence of prime numbers
- B. Strings with substring WW^r in between
- C. Palindrome strings
- D. Strings with even number of Zero's

100. What is the notation used to describe the sequence of states of a given automata for a given input?

- A. Automaton
- B. Instantaneous description
- C. Computation
- D. Transition function

Computer Security

101. Which type of firewall is considered most secure but potentially slower?

- A. Packet-filtering
- B. Proxy firewall
- C. Stateful inspection
- D. NAT firewall

102. Which access control model is based on the user's identity?

- A. Mandatory Access Control (MAC)
- B. Role-Based Access Control (RBAC)
- C. Discretionary Access Control (DAC)
- D. Rule-Based Access Control

103. A brute-force attack in cryptography tries to:

- A. Guess the encryption key by trying all possible combinations
- B. Guess the encryption algorithm
- C. Overload the CPU
- D. Crack passwords by social engineering

104. Which of the following uses the same key for both encryption and decryption?

- A. Public-key cryptography
- B. Asymmetric encryption
- C. Symmetric encryption
- D. Hashing

105. Which of these can help mitigate the risk of Cross-Site Scripting (XSS)?

- A. Disabling cookies
- B. Sanitizing user input
- C. Compressing data
- D. Using weak encryption

106. Which of the following is a common software vulnerability ?

- A. SQL injection
- B. Firewall misconfiguration
- C. IP spoofing
- D. Packet sniffing

107. Which is an example of multi-factor authentication in network security?

- a. Password and CAPTCHA
- b. Password and username
- c. Password and fingerprint
- d. Security question

Compiler Design

108. In a grammar with productions $A \rightarrow aB \mid bA \mid bBa$, $B \rightarrow bB \mid cA \mid b$; which terminal will belong to the first of B?

- A. a
- B. b
- C. c
- D. B and C

109. Which action of the bottom-up parsing moves terminals from input buffer to the stack?

- A. Shift
- B. Accept
- C. Reduce
- D. augment

110. What is the name of a grammar in which all attributes of the grammar symbols are synthesized attributes and some form of inherited attributes?

- A. S-attributed grammar
- B. L-attributed grammar
- C. M-attributed grammar
- D. None

111. Which attribute's value is computed from the values of attributes at the children of that node in the parse tree?

- A. Inherited attributes
- B. Dependency attributes
- C. Synthesized attributes
- D. None

- 112.** Which one of the following is used to determine a series of characters as a token?
- A. Lexeme
 - B. Alphabet
 - C. Grammar
 - D. None
- 113.** What is the other name given to the bottom-up parsing?
- A. Shift-reduce parsing
 - B. Predictive parsing
 - C. Recursive descent parsing
 - D. Non-recursive parsing
- 114.** What we call a grammar that produces more than one parse tree for a particular string?
- A. Regular
 - B. Ambiguous
 - C. Unambiguous
 - D. Non-regular
- 115.** Which one of the following is not an approach for parsing?
- A. Top-down approach
 - B. Bottom-up approach
 - C. Left-to-right approach
 - D. None