CCE(P) - 2015
COMPUTER SCIENCE

1. The worst-case time complexity of quicksort is

(A) $O(n \log n)$

(B) $O(n)$

(C) $O(n^2)$

(D) Both (A) and (B)

2. In C programming, the operator '&' is used to represent

(A) logical AND

(B) bitwise AND

(C) logical OR

(D) bitwise OR

3. What is the output of the following program segment?

```
for (i = 5; i < 5; i--)
    printf ("Assam\n");
```

(A) Print Assam for 5 times

(B) No output

(C) Print Assam for infinite times

(D) Print Assam for 1 time

4. Which one of the following in C programming will set the value of y to 5 if x has the value 3, but not otherwise?

(A) if (x = 3) y = 5;

(B) if x == 3 (y = 5)

(C) if (x == 3); y = 5;

(D) if (x == 3) y = 5;

5. Which of the following is the correct order, if the functions are arranged in ascending order of their growth?

(A) $1, n, \log n, n \log n$

(B) $1, \log n, n, n \log n$

(C) $n, \log n, n \log n, 1$

(D) $1, n \log n, n, \log n$

6. When is a static variable initialized?

(A) First time when a loop is executed

(B) All time when a loop is executed

(C) It cannot be initialized

(D) None of the above

7. What is the maximum height of any AVL tree with 7 nodes? Assume that the height of a tree with a single node is 0.

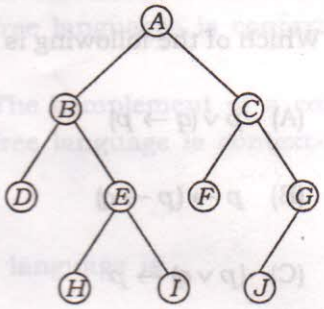
(A) 2

(B) 3

(C) 4

(D) 5

8. A binary tree is given below :



Which one of the following is the inorder, preorder and postorder traversal respectively?

(A) *DBHEIAFCJG, ABDEHICFJG, DHIEBFJGAC*

(B) *DBHEIAFCJG, ABDEHICFJG, DHIEBFJAGC*

(C) *DBHEIAFCJG, ABDEHICFGJ, DHIEBFJGCA*

(D) *DBHEIAFCJG, ABDEHICFJG, DHIEBFJGCA*

9. The programming language C uses

(A) row-major order

(B) column-major order

(C) Either (A) or (B)

(D) None of the above

10. The data structure used in recursive algorithm is

(A) stack

(B) queue

(C) priority queue

(D) None of the above

11. Which of the following problems is not NP-complete?

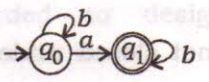
(A) Hamilton cycle problem

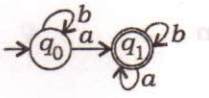
(B) Clique problem

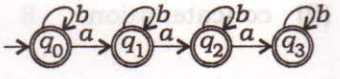
(C) 3SAT problem

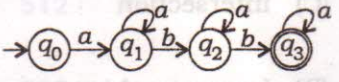
(D) Set membership problem

12. Construct DFA for $\Sigma = \{a, b\}$ that accepts all strings with not more than three a.

(A) 

(B) 

(C) 

(D) 

13. The language accepted by finite automata is

(A) type 0

(B) type 1

(C) type 2

(D) type 3

14. The regular set denoted by the regular expression $(a + b)^*$

(A) contains ε as a member element

(B) does not contain ε as a member element

(C) may or may not contain ε as a member element

(D) Information is insufficient to decide

15. CFLs are not closed under

(A) union

(B) concatenation

(C) intersection

(D) homomorphism

16. To implement top-down parsing, the grammar should be of the type

(A) LL(1)

(B) LL(2)

(C) LL(3)

(D) Any of the above

17. Which of the following is a tautology?

(A) $p \vee (q \rightarrow p)$

(B) $p \rightarrow (p \rightarrow q)$

(C) $(p \vee q) \rightarrow p$

(D) $p \vee (p \rightarrow q)$

18. What is the language generated by the following production rules?

$S \rightarrow ab$
$S \rightarrow bS$
$S \rightarrow a$
$S \rightarrow b$

(A) $L(G) = \{a, b\}^n$

(B) $L(G) = \{a, b\}^+$

(C) $L(G) = \{a, b\}^*$

(D) $L(G) = \{a, b\}$

19. Which of the following statements is true?

(A) If a language is context-free, it can always be accepted by a deterministic pushdown automaton

(B) The union of two context-free languages is context-free

(C) The intersection of two context-free languages is context-free

(D) The complement of a context-free language is context-free

20. The C language is

(A) a context-free language

(B) a context-sensitive language

(C) a regular language

(D) parsable fully only by a Turing machine

21. A Turing recognizable language is a superset of

(A) context-sensitive language

(B) context-free language

(C) regular language

(D) All of the above

22. How many 32K × 1 RAM chips are needed to provide a memory capacity of 256 Kbytes?

(A) 8

(B) 32

(C) 64

(D) 128

23. The addressing mode in an instruction of the form ADD 05, 06 is

(A) absolute

(B) immediate

(C) indirect

(D) index

24. The minimum number of *D* flip-flops needed to design a mod–258 counter is

(A) 9

(B) 8

(C) 512

(D) 258

25. $(1217)_8$ is equivalent to

(A) $(1217)_{16}$

(B) $(028F)_{16}$

(C) $(2298)_{10}$

(D) $(0B17)_{16}$

26. The number 43 in 2's complement representation is

(A) 01010101

(B) 11010101

(C) 00101011

(D) 10101011

27. Which of the following gates is/are called universal gate?

(A) NOR

(B) NAND

(C) Both NOR and NAND

(D) None of the above

28. The number of select lines in a 32×1 multiplexer is

(A) 32

(B) 5

(C) 4

(D) None of the above

29. A full adder can add

(A) 2 bits

(B) 3 bits

(C) 4 bits

(D) 5 bits

30. MVI A, 05H is

(A) one-byte instruction

(B) two-byte instruction

(C) three-byte instruction

(D) four-byte instruction

31. What is the reason for using translation look-aside buffer (TLB) in a computer?

(A) To store printer data

(B) To enhance memory capacity

(C) To increase processing speed

(D) All of the above

32. Shadow paging is a

(A) deadlock prevention technique

(B) database recovery technique

(C) concurrency control technique

(D) deadlock detection technique

33. Which one of the following is a high-level data model?

(A) Network model

(B) Hierarchical model

(C) ER model

(D) None of the above

34. The key which is a set of one or more attributes that taken collectively and which allows us to identify uniquely an entity in the entity set is called

(A) primary key

(B) partial key

(C) candidate key

(D) super key

35. Cascading rollback can be avoided by

(A) two-phase locking protocol

(B) strict two-phase locking protocol

(C) Cannot be avoided

(D) Can be avoided, but there is no actual protocol

36. The column of a table is referred as

(A) tuple

(B) attribute

(C) entity

(D) degree

37. The database remains in a consistent state despite the system failure are ensured by

(A) transaction manager

(B) query processor

(C) storage manager

(D) data model

38. Which normal form is considered adequate for relational database design?

(A) 2NF

(B) 3NF

(C) 4NF

(D) BCNF

39. Desirable properties of transactions are

(A) atomicity, concurrency control, isolation, durability

(B) atomicity, consistency preservation, isolation, durability

(C) atomicity, correctness, isolation, durability

(D) atomicity, conflict serializable, isolation, durability

40. Error control is normally implemented in

(A) data-link layer only

(B) transport layer only

(C) network layer

(D) both data-link and transport layer

41. If the bandwidth of a signal is 5 kHz and the lowest frequency is 52 kHz, what is the highest frequency?

(A) 5 kHz

(B) 47 kHz

(C) 57 kHz

(D) 10 kHz

42. An Ethernet address

(A) can be unique

(B) can be duplicated

(C) can be optimal

(D) can never be duplicated

43. Which multiplexing technique transmits digital signals?

(A) FDM

(B) TDM

(C) WDM

(D) None of the above

44. RFC stands for

(A) request for comments

(B) request for comprehension

(C) resolution for computing

(D) resolution for communication

45. The Internet uses

(A) circuit switching

(B) packet switching

(C) hybrid switching

(D) None of the above

46. In the IPv4 addressing format, the number of networks allowed under class C address is

(A) 2^{14}

(B) 2^{7}

(C) 2^{21}

(D) 2^{24}

47. Which of the following transport layer protocols is used to support electronic mail?

(A) SMTP

(B) IP

(C) TCP

(D) UDP

48. A process executes the code

```
fork( );
fork( );
fork( );
```

The total number of child processes created is

(A) 3

(B) 4

(C) 7

(D) 8

49. What is a shell?

(A) It is a hardware component

(B) It is a command interpreter

(C) It is a part of compiler

(D) It is a tool in CPU scheduling

50. The mechanism that brings a page into memory only when it is needed is called

(A) segmentation

(B) fragmentation

(C) demand paging

(D) page replacement

51. Which type of grammar is not classified by Chomsky?

(A) Type 0

(B) Type 1

(C) Type 2

(D) None of the above

52. BIOS stands for

(A) basic input-output services

(B) basic input-output system

(C) basic input-output server

(D) basic input-output software

53. Which of the following can correct error?

(A) CRC

(B) Hamming code

(C) Parity

(D) Check digit

54. HTTP is _____ protocol.

(A) a stateless

(B) a stateful

(C) both stateless and stateful

(D) neither stateful nor stateless

55. In an email id, the prefix refers to the

(A) domain name

(B) IP address

(C) user name

(D) Both (A) and (C)

56. FIFO scheduling is

(A) preemptive scheduling

(B) non-preemptive scheduling

(C) deadlock scheduling

(D) fare-share scheduling

57. Consider the following four processes with length of the CPU burst time given in milliseconds :

Process	*Arrival Time*	*Burst Time*
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

Using shortest-remaining time first scheduling algorithm, calculate the average waiting time in millisecond.

(A) 7·75

(B) 6·5

(C) 5·5

(D) 8·75

58. In which one of the following page replacement policies, Belady's anomaly may occur?

(A) FIFO

(B) Optimal

(C) LRU

(D) MRU

59. In round robin scheduling, as the time quantum is increased, the average turn-around time

(A) increases

(B) decreases

(C) remains constant

(D) varies irregularly

60. Where does the swap space reside?

(A) RAM

(B) Disk

(C) ROM

(D) on-chip cache

61. The total number of maturity levels in CMM is

(A) 1

(B) 3

(C) 5

(D) 7

62. Which one is not a size measure for software?

(A) LOC

(B) Function point

(C) Cyclomatic complexity

(D) Halstead's program length

63. The most desirable form of coupling is

(A) control coupling

(B) data coupling

(C) common coupling

(D) content coupling

64. Regression testing is primarily related to

(A) functional testing

(B) dataflow testing

(C) development testing

(D) maintenance testing

65. Cyclomatic complexity is equal to

(A) number of independent paths

(B) number of paths

(C) number of edges

(D) number of vertices

66. The maximum possible value of reliability is

(A) 100

(B) 10

(C) 1

(D) 0

67. MTBF stands for

(A) mean time between failures

(B) maximum time between failures

(C) minimum time between failures

(D) many time between failures

68. Segmentation is done in

(A) transport layer

(B) network layer

(C) data-link layer

(D) physical layer

69. Routing is done in

(A) network layer

(B) physical layer

(C) data-link layer

(D) transport layer

70. A circular list can be used to represent

(A) stack

(B) queue

(C) tree

(D) Both (A) and (B)

71. We use malloc and calloc for

(A) dynamic memory allocation

(B) static memory allocation

(C) both dynamic and static memory allocation

(D) None of the above

72. The data transfer in which data transfer is to be done quickly is

(A) programmed I/O

(B) interrupt I/O

(C) DMA

(D) None of the above

73. The ability to temporarily halt the CPU and use this time to send information on buses is called

(A) direct memory access

(B) vectoring the interrupt

(C) polling

(D) cycle stealing

74. Register variable is stored in

(A) processor

(B) RAM

(C) ROM

(D) peripheral memory

75. What is the purpose of Typecasting?

(A) To create new data types

(B) To change the data type of a variable

(C) To convert the data stored in a variable to a different type before using it as expression

(D) To prevent the loss of data when passing values to function

76. Operand is fetched from memory during

(A) fetch phase

(B) execute phase

(C) decode phase

(D) read phase

77. Which of the following prints the fastest silently?

(A) Dot-matrix printer

(B) Laser printer

(C) DeskJet printer

(D) None of the above

78. Assembly language statement for action is called

(A) assembler directive

(B) imperative statement

(C) declarative statement

(D) None of the above

79. The language

$L = \{a^n b^n c^m d^m \mid n, m \geq 1\}$

is

(A) regular language

(B) CFL

(C) both regular and CFL

(D) neither regular nor CFL

80. COCOMO means

(A) constructive cost model

(B) cost constructive model

(C) constructive cost mode

(D) constructive cost modeling

81. The term 'instantiation' refers to the creation of

(A) a class from a blueprint

(B) an object from a class

(C) a method from an object

(D) a property from a method

82. Inheritance makes it easier to

(A) reuse and modify existing modules of code

(B) write and read code by sharing method

(C) hide and protect data from external code

(D) Both (A) and (B)

83. What does IDE stand for?

(A) Integrated development environment

(B) Integrated design environment

(C) Interior development environment

(D) Interior design environment

84. An exception is another name for a

(A) compile error

(B) logic error

(C) runtime error

(D) syntax error

85. The scope of variable refers to the

(A) length of a variable

(B) name of a variable

(C) accessibility of a variable

(D) data type of a variable

86. Which is not a valid type of Join?

(A) Left Join

(B) Middle Join

(C) Right Join

(D) Inner Join

87. Which one is more appropriate for reading a multiword string?

(A) scanf

(B) getchar( )

(C) gets

(D) getc

88. Find the odd one considering C language.

(A) a = a + 1;

(B) a+ = 1;

(C) a + +;

(D) a = +1;

89. Match the following and select the correct answer from the codes given below :

a. Product complexity	1. Software requirements definition
b. Structured system design	2. Software design
c. Coupling and cohesion	3. Validation technique
d. Symbolic execution	4. Software cost estimation

Codes :

(A)	a	b	c	d
	2	3	4	1
(B)	a	b	c	d
	3	1	4	2
(C)	a	b	c	d
	4	1	2	3
(D)	a	b	c	d
	3	4	1	2

90. Sequential representation of a binary tree is efficient when the binary tree is

(A) complete

(B) almost complete

(C) threaded tree

(D) Both (A) and (B)

91. To avoid race condition, the number of processes that may be simultaneously inside the critical section is

(A) 3

(B) 2

(C) 1

(D) 0

92. Which of the following converts the high-level language into machine language?

(A) Opcode

(B) Operand

(C) Compiler

(D) ALU

93. Which of the following concepts are mainly used in imperative languages?

(A) Variables, assignments and sequencing

(B) Variables, assignments and functions

(C) Variables, assignments and parameters

(D) Variables, assignments and overloading

94. Match the following with respect to C language data types and select the correct answer from the codes given below :

a. Character	1. "1"
b. String	2. 1
c. Integer	3. 1·0
d. Floating point	4. '1'

Codes :

(A)	a	b	c	d
	1	2	4	3
(B)	a	b	c	d
	2	1	4	3
(C)	a	b	c	d
	3	2	4	1
(D)	a	b	c	d
	4	1	2	3

95. What is the maximum number of different Boolean functions involving n Boolean variables?

(A) n^2

(B) 2^n

(C) 2^{n+1}

(D) $n+1$

96. In Linux operating system, each process is represented by a/an

(A) I node

(B) process control block

(C) process number

(D) process state

97. Test suite is a

(A) set of test cases

(B) set of inputs

(C) set of outputs

(D) None of the above

98. A functional dependency $X \rightarrow Y$ is trivial, if

(A) $X \supseteq Y$

(B) $Y \supseteq X$

(C) $Y \supset X$

(D) $X \supset Y$

99. The number of processes completed per unit time is known as

(A) output

(B) throughput

(C) efficiency

(D) capacity

100. What is performed through the entire duration of the project?

(A) Risk monitoring

(B) Risk projection

(C) Risk identification

(D) Risk assessment