

1. The primary purpose of templates in C++ is
 - (A) To enable dynamic polymorphism at run time
 - (B) To allow code reuse for different data types
 - (C) To define abstract classes
 - (D) To handle exceptions
 - (E) Answer not known

2. _____ header file provides simultaneous input and output operations.
 - (A) <filebuf>
 - (B) <fstream>
 - (C) <fstreambase>
 - (D) <ofstream>
 - (E) Answer not known

3. How many types of exceptions are available in C++?
 - (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) Answer not known

4. Which container in C++ STL does not allow duplicate elements?
 - (A) Vector
 - (B) List
 - (C) Set
 - (D) Map
 - (E) Answer not known

5. Which operator is used to allocate memory dynamically at run time?
- (A) Size of (B) Create
(C) Delete (D) Malloc
(E) Answer not known
6. Which of the following permits function overloading on C++?
- (A) Type
(B) Number of arguments
(C) Type and number of arguments
(D) Number of objects
(E) Answer not known
7. Which of the following string function removes characters as specified?
- (A) erase () (B) empty ()
(C) remove () (D) delete ()
(E) Answer not known
8. What is the default storage class of any type of variable in C++?
- (A) Static (B) Extern
(C) Automatic (D) Register
(E) Answer not known

9. Which of the following is not a storage class specifier in C++?
- (A) Automatic (B) Register
(C) Static (D) Dynamic
(E) Answer not known
10. With objects we can access the public members of a class using a
- (A) Dot operator (B) Arrow operator
(C) Conditional operator (D) Relational operator
(E) Answer not known
11. Which of the following is not suitable for overloading all the C++ operators?
- (A) Operations on strings
(B) Operating using friends
(C) Unary minus (−)
(D) Scope resolution operator (::)
(E) Answer not known
12. What happens when a file is opened using “a+” mode?
- (A) Writing is done from the beginning of the file
(B) File content is deleted before writing
(C) Reading is allowed; writing always occurs at the end
(D) File is opened only for reading
(E) Answer not known

13. The purpose of `#define` directive in “C programming” is

- (A) To include a header file
- (B) To define a constant or a macro
- (C) To define a function
- (D) To allocate memory dynamically
- (E) Answer not known

14. What will be the output of this code?

```
# include <stdio.h>
```

```
# define MAX 100
```

```
int main ( )
```

```
{
```

```
    # ifdef MAX
```

```
        printf (“MAX is defined\n”);
```

```
    # else
```

```
        printf (“MAX is not defined\n”);
```

```
    # endif
```

```
    return 0;
```

```
}
```

- | | |
|------------------------|-----------------------|
| (A) MAX is not defined | (B) Compilation error |
| (C) MAX is defined | (D) MAX = 100 |
| (E) Answer not known | |

15. Which of the following statements correctly increments a pointer to point to the next elements in an array?
- (A) ++P (B) P++
(C) Both (A) and (B) (D) P+1
(E) Answer not known
16. Pointers in 'C' programming is
- (A) A keyword used to declare variables
(B) A variable that stores memory address of another variable
(C) A user defined function
(D) A built-in function
(E) Answer not known
17. The size of a union is determined by the size of the
- (A) Lowest member in the union
(B) Biggest member in the union
(C) First member in the union
(D) Last member in the union
(E) Answer not known
18. Definition of function in 'C' programming should contain
- (A) Function name, return type and parameters (if any)
(B) Only the function name and body
(C) Only the return type and parameters
(D) Only the function name and parameters
(E) Answer not known

19. How is a union different from a structure in 'C' programming?
- (A) Structure stores one value at a time; union stores all
 - (B) Both store all members at once
 - (C) Union stores only one member value at a time; structure stores all
 - (D) No difference
 - (E) Answer not known
20. When the compiler assigns a character string to a character array, it automatically supplies a _____ at the end of the string
- (A) \\
 - (B) \n
 - (C) \ o
 - (D) \ t
 - (E) Answer not known
21. The syntax for an infinite for loop is
- (A) for ()
 - (B) for (; ;)
 - (C) for (condition)
 - (D) for (; condition ;)
 - (E) Answer not known
22. Choose the correct datatype to store the value 'A' in 'C' programming
- (A) int
 - (B) char
 - (C) float
 - (D) double
 - (E) Answer not known

23. What is the size of a char datatype in 'C' programming?
- (A) 1 byte (B) 2 bytes
(C) 4 bytes (D) 8 bytes
(E) Answer not known
24. The _____ is a sequenced collection of related data items that share a common name.
- (A) List (B) Array
(C) Relation (D) Variable group
(E) Answer not known
25. An array is also known as
- (A) Subscripted variable (B) Collective array
(C) Ordinary variable (D) Similar Quantities variable
(E) Answer not known
26. Which component is responsible for coordinating the activities of the system and executing instructions in a computer?
- (A) Control unit (B) Arithmetic and Logic unit
(C) Memory unit (D) Mother Board
(E) Answer not known

27. _____ is the process of electronically extracting data from marked fields.
- (A) Bar code Reader
 - (B) Optical character Recognition
 - (C) Optical mark Recognition
 - (D) Magnetic Ink character Reader
 - (E) Answer not known
28. The first alphabet of LAN, WAN and MAN in computer networks stands for
- (A) Local, Wireless and Metropolitan
 - (B) Local, World and Middle
 - (C) Local, Wide and Metropolitan
 - (D) Local, Wireless and Maximum
 - (E) Answer not known
29. Which of the following software is more suitable for word processing?
- (A) Microsoft Excel
 - (B) Google chrome
 - (C) Microsoft word
 - (D) Adobe Photoshop
 - (E) Answer not known
30. _____ is the abbreviation of “QAT” in Microsoft word.
- (A) Quick Access Toolbar
 - (B) Quick Action Tool
 - (C) Quick Access Tool
 - (D) Quality Assurance Testing
 - (E) Answer not known

31. Which of the following are arithmetic operators in python?
- (i) /
 - (ii) //
 - (iii) %
 - (iv) !=
- (A) (iii), (iv) (B) (i), (ii), (iii)
(C) (ii), (iii) (D) (i), (ii)
(E) Answer not known
32. How to pair a variable length arguments to a function in python?
- (A) using ** args (B) using * args
(C) using * kwargs (D) using ** kwargs
(E) Answer not known
33. Tuples are used to format
- (A) Arrays (B) Variables
(C) Strings (D) Constants
(E) Answer not known
34. _____ operation returns true if all elements of the list are true.
- (A) any (B) all
(C) list (D) len
(E) Answer not known

35. _____ specifies a variable - length argument in python.
- (A) + (B) *
- (C) % (D) /
- (E) Answer not known
36. Identify the right representation of writing “python programming” to file.
- (A) write (file, “python programming”)
- (B) file. write (“python programming”)
- (C) write (“python programming”, file)
- (D) write. file (“python programming”, file)
- (E) Answer not known
37. Identify which one of the statement is valid in Python programming.
- (a) Reassigning variables as many times as required is allowed
- (b) Python variables do not have specific datatypes
- (c) Identifiers are not case sensitive
- (d) \$ is allowed in naming the Python variable
- (A) (a) and (b) (B) (c) and (d)
- (C) (a) and (c) (D) (b) and (c)
- (E) Answer not known

38. Python is a purely
- (A) Script Oriented Language
 - (B) Structural Oriented Language
 - (C) Procedure Oriented Language
 - (D) Object Oriented Language
 - (E) Answer not known
39. If member of arguments in function definition and function call does not match, then which type of error is returned?
- (A) Name Error
 - (B) Import Error
 - (C) Type Error
 - (D) Number Error
 - (E) Answer not known
40. What happens if a file opened in 'w' mode does not exist?
- (A) File will be created
 - (B) Error will be generated
 - (C) File contents are deleted
 - (D) Nothing will happen
 - (E) Answer not known
41. If the time between arrivals is exponential with mean $\frac{1}{\lambda}$, then the number of arrivals during a specific period t is:
- (A) Exponential with parameter λ
 - (B) Exponential with parameter λt
 - (C) Poisson with mean $\frac{1}{\lambda t}$
 - (D) Poisson with mean λt
 - (E) Answer not known

42. State of a Markov Chain is said to be persistent if
- (A) $F_{jj} = 0$ (B) $F_{jj} > 0$
 (C) $F_{jj} = 1$ (D) $F_{jj} < 1$
 (E) Answer not known
43. The marginal probability density function of X from a joint density $f_{X,Y}(x, y)$ is obtained by
- (A) Integrating $f_{X,Y}(x, y)$ with respect to y
 (B) Differentiating $f_{X,Y}(x, y)$ with respect to y
 (C) Integrating $f_{X,Y}(x, y)$ with respect to x
 (D) Multiplying $f_{X,Y}(x, y)$ by y
 (E) Answer not known
44. The MGF of geometric distribution with parameter P is:
- (A) $(q + Pe^t)^n$ (B) $e^{P(e^t - 1)}$
 (C) $P(1 - qe^t)^{-1}$ (D) $P(1 + qe^t)$
 (E) Answer not known

45. If X_1 and X_2 are two independent random variables from Binomial $\left(3, \frac{1}{3}\right)$, MGF of $X_1 + X_2$ is:
- (A) $\left(\frac{2}{3} + \frac{e^t}{3}\right)^9$ (B) $\left(\frac{2}{3} + \frac{2e^t}{3}\right)^9$
 (C) $\left(\frac{2}{3} + \frac{e^t}{3}\right)^6$ (D) $\left(\frac{1}{3} + \frac{e^t}{3}\right)^3$
 (E) Answer not known
46. What is an Artificial Neural Network (ANN)?
- (A) A computational model inspired by the human brain
 (B) A machine learning algorithm used for image processing
 (C) A statistical analysis technique for data clustering
 (D) A programming language for Neural Network implementation
 (E) Answer not known
47. What is the purpose of the back propagation algorithm in ANN training?
- (A) To update the weights and biases based on the prediction error
 (B) To initialize the weights and biases of the network
 (C) To determine the number of hidden layers and neurons
 (D) To determine the number of input layers and neurons
 (E) Answer not known

48. $f(x) = \frac{1}{1 + e^{-x}}$ is the most commonly used activation function in back propagation MLP. Identify the function name
- (A) ADALINE function
 - (B) Identify function
 - (C) Logistic function
 - (D) Hyperbolic tangent function
 - (E) Answer not known
49. Given the Numpy array x_2 .
- $$x_2 = \text{np. array} ([[12, 5, 2, 4] [7, 6, 8, 8] [1, 6, 7, 7]])$$
- What is the output of the slicing operation $x_2[:3, ::2]$?
- (A) $[[12, 5], [7, 6] [1, 6]]$
 - (B) $[[12, 2], [7, 8], [1, 7]]$
 - (C) $[[12, 2, 4], [7, 8, 8], [1, 7, 7]]$
 - (D) $[[5, 4], [6, 8], [6, 7]]$
 - (E) Answer not known
50. The z-score of a feature (f) with mean (μf) and standard deviation (σf) is calculated to standardize the data. Which of the following formula represent the transformation to compute the z-score of a value x in f ?
- (A) $z = x + \mu f / \sigma f$
 - (B) $z = x - \mu f / \sigma f$
 - (C) $z = x - \sigma f / \mu f$
 - (D) $z = \sigma f / x - \mu f$
 - (E) Answer not known

51. What does the mean represent in a data set?
- (A) Middle value
 - (B) Most frequent value
 - (C) Difference between the highest and lowest values
 - (D) Average of all values
 - (E) Answer not known
52. Choose from the following step that is not in data wrangling
- (A) Data Mining
 - (B) Data filtration
 - (C) Data reduction
 - (D) Data Merging
 - (E) Answer not known
53. Choose from the following which is NOT a type of plot available in seaborn?
- (A) Tree plot
 - (B) Scatter plot
 - (C) Violin plot
 - (D) Box plot
 - (E) Answer not known
54. The line that linearly separates and classifies a set of data in SVM
- (A) Hyper plane
 - (B) Soft margin
 - (C) Linear margin
 - (D) Support vectors
 - (E) Answer not known

55. You want to test the hypothesis that “Gabe's algorithm is better than mine”. What is the appropriate null hypothesis in this context?
- (A) Gabe’s algorithm is significantly better than mine
 - (B) Gabe’s algorithm is always worse than mine
 - (C) Gabe’s algorithm is no better than mine
 - (D) Both algorithms are equally bad
 - (E) Answer not known
56. Which attribute selection measure is used in ID₃ Decision Tree Algorithm?
- (A) Information Gain
 - (B) Gain Ratio
 - (C) Gini Index
 - (D) Tree Pruning
 - (E) Answer not known
57. The Elbow method in clustering is used to _____
- (A) Measure the distance between clusters and merge them
 - (B) Determine the optimal number of clusters (K) by evaluating within cluster homogeneity or heterogeneity
 - (C) Normalize the dataset before clustering
 - (D) Assign data points to the nearest cluster center
 - (E) Answer not known

58. Which type of regularization does Ridge Regression use, and how does it apply the penalty?
- (A) L_1 regularization; adds the absolute value of the coefficient
 - (B) L_2 regularization; adds the square of the magnitude of coefficients
 - (C) L_1 regularization; adds the logarithm of the coefficient
 - (D) L_2 regularization; adds the absolute value of the coefficients
 - (E) Answer not known
59. What is the key principle behind Bayesian Learning Methods?
- (A) Choosing the hypothesis that minimizes the error on training data only
 - (B) Assigning equal probabilities to all hypothesis
 - (C) Consider the probability of a hypothesis based on prior knowledge and observed data
 - (D) Ignoring prior probabilities in favor of data-driven learning only
 - (E) Answer not known
60. Which type of intelligent agent has the key feature of condition-action rule?
- (A) Simple reflex agents
 - (B) Model-based reflex agents
 - (C) Goal-based agents
 - (D) Utility-based agents
 - (E) Answer not known

61. Which language has the facts with degree of truth $t[0,1]$?
- (A) Binary Language
 - (B) Propositional Logic
 - (C) First order Logic
 - (D) Fuzzy Logic
 - (E) Answer not known
62. Among the following, which algorithm is known to be a standard algorithm for supervised Learning
- (A) Principal Component Analysis (PCA)
 - (B) Q-learning
 - (C) Support Vector Machine (SVM)
 - (D) Self – Organizing Map (SOM)
 - (E) Answer not known
63. Uniform – cost search method is also called as
- (A) Breadth – first search algorithm
 - (B) Dijkstra’s algorithm
 - (C) Backtracking algorithm
 - (D) Iterative deepening search algorithm
 - (E) Answer not known
64. Name the uninformed search algorithm from the following
- (A) A* search
 - (B) Depth – First search
 - (C) Greedy – Best – First – Search
 - (D) Hill – Climbing
 - (E) Answer not known

65. The acronym LASSO in regression analysis stands for
- (A) Least Absolute Shrinkage Selector Operator
 - (B) Linear Approximation by Shrinkage and Selection Optimization
 - (C) Least Average Sum of Squares Operator
 - (D) Linear Adaptive Subset Selection Operator
 - (E) Answer not known
66. When cache size increases, hit ratio?
- (A) Decreases
 - (B) Increases
 - (C) Remains constant
 - (D) Remains unpredictable
 - (E) Answer not known
67. Which paging algorithm tends to minimize the number of page faults?
- (A) FIFO-First In First Out
 - (B) LRU-Least Recently Used
 - (C) NRU-Not Recently Used
 - (D) MRU-Most Recently Used
 - (E) Answer not known
68. _____ quickly maps virtual page numbers onto physical page frame numbers.
- (A) Translation lookaside buffer
 - (B) Address space identifier
 - (C) Cache buffer
 - (D) Page reference indicator
 - (E) Answer not known

69. Which of the following memory takes less accessing time?

- (A) Main memory (B) Cache memory
(C) Optical disk (D) Magnetic disk
(E) Answer not known

70. Match the functionalities of the CPU units :

- | | |
|------------------|---|
| (a) Input unit | 1. Retrieves data from the CPU |
| (b) Output unit | 2. Stores the data that are to be immediately processed |
| (c) Memory unit | 3. Directs the other units |
| (d) Control unit | 4. Feeds data into the CPU |

- | | (a) | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 4 | 1 | 2 | 3 |
| (B) | 2 | 3 | 4 | 1 |
| (C) | 1 | 4 | 2 | 3 |
| (D) | 4 | 3 | 2 | 1 |
| (E) | Answer not known | | | |

71. Arrange the data preprocessing techniques in order

- (i) Data cleaning
(ii) Data transformation
(iii) Data reduction
(iv) Data integration
- (A) (i), (ii), (iii), (iv) (B) (i), (iv), (ii), (iii)
(C) (i), (ii), (iv), (iii) (D) (i), (iii), (ii), (iv)
(E) Answer not known

72. The data management techniques that are available in mobile database are
- (i) Cache consistency
 - (ii) Data replication
 - (iii) Query processing
 - (iv) Data recovery
- (A) (i), (ii), (iii),(iv) (B) (i), (ii), (iii)
(C) (ii), (iii),(iv) (D) (i), (iii),(iv)
(E) Answer not known
73. Identify a sequence of operations that are needed to store a new word into memory.
- (i) Activate the write control input
 - (ii) Transfer the data bits of the word into memory buffer register
 - (iii) Transfer the address bits of the word into memory address register.
- (A) (i), (ii) and (iii) (B) (ii), (iii) and (i)
(C) (i), (iii) and (ii) (D) (iii), (ii) and (i)
(E) Answer not known

74. Match the following instruction set operations based on its category:

- | | |
|-------------------------|-------------|
| (a) Data transfer | 1. Compare |
| (b) Arithmetic | 2. Execute |
| (c) Logical | 3. Exchange |
| (d) Transfer of control | 4. Absolute |

- | | (a) | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 2 | 1 | 4 | 3 |
| (B) | 3 | 4 | 1 | 2 |
| (C) | 4 | 1 | 2 | 3 |
| (D) | 4 | 3 | 2 | 1 |
| (E) | Answer not known | | | |

75. The actual mapping to a physical address is a function of the

- | | |
|---------------------------|----------------------------|
| (A) Arithmetic logic unit | (B) Memory management unit |
| (C) Address shifting unit | (D) Address mapping unit |
| (E) Answer not known | |

76. In 2's complement representation, if two numbers with the same sign are added, then _____ occurs if and only if the result has the opposite sign.

- | | |
|----------------------|---------------|
| (A) Overflow | (B) Underflow |
| (C) Break | (D) Failure |
| (E) Answer not known | |

77. A parallel computer in which all the CPUs share a common memory is called a
- (A) Multicomputer (B) Distributed computer
(C) Distributed system (D) Multiprocessor
(E) Answer not known
78. Match the description of an addressing mode with its name.
- | | |
|--------------------------|--|
| (a) Immediate addressing | 1. Address field contains the effective address of the operand |
| (b) Direct addressing | 2. The operand value is present in the instruction |
| (c) Indirect addressing | 3. Referenced register is the program counter |
| (d) Relative addressing | 4. Limits the address range |
- | | | | | |
|-----|------------------|-----|-----|-----|
| | (a) | (b) | (c) | (d) |
| (A) | 4 | 3 | 1 | 2 |
| (B) | 3 | 4 | 1 | 2 |
| (C) | 2 | 1 | 4 | 3 |
| (D) | 3 | 4 | 2 | 1 |
| (E) | Answer not known | | | |
79. Which address machines are referred to as stack machines?
- (A) Zero address machines (B) One address machines
(C) Two address machines (D) Three address machines
(E) Answer not known

80. Which of the following abbreviations are true?
- (i) ROM – Read Only Memory
 - (ii) PROM – Programmable Read Only Memory
 - (iii) EPROM – Editable Programmable Read Only Memory
- (A) (i) and (ii) are true
- (B) (ii) and (iii) are true
- (C) (i) and (iii) are true
- (D) (i), (ii) and (iii) are true
- (E) Answer not known
-
81. Arrange the multiplication operation in the order of first operand, second operand and the final result.
- (A) Multiplier, product and multiplicand
 - (B) Multiplicand, product and multiplier
 - (C) Multiplier, multiplicand and product
 - (D) Multiplicand, multiplier and product
 - (E) Answer not known

82. Identify the equivalent expression of boolean function $ABC + A\overline{B}\overline{C}$
- (A) ABC (B) $A\overline{B}\overline{C}$
 (C) $AB\overline{C}\overline{C}$ (D) AB
 (E) Answer not known
83. Binary digits are grouped into sets of four bits, called a
- (A) Code (B) Word
 (C) Ripple (D) Nibble
 (E) Answer not known
84. The register contains additional bits, called _____ which are used to pad out the right end of the significant with OS.
- (A) Trailing bits (B) Aligning bits
 (C) Rounding bits (D) Guard bits
 (E) Answer not known
85. The characteristics of a multiplexer are
- (i) Multiple outputs
 (ii) Multiple inputs
 (iii) One output
 (iv) Select lines determine active input
- (A) (ii), (iii) (B) (ii), (i)
 (C) (ii), (iv) (D) (ii), (iii), (iv)
 (E) Answer not known

86. What is true about a distributed system?
- (A) It is a collection of processor
 - (B) All processors are synchronized
 - (C) They do not share memory
 - (D) (A) and (C)
 - (E) Answer not known
87. Which one is not a necessary condition for deadlock to occur?
- (A) Mutual exclusion
 - (B) Hold and wait
 - (C) No preemption
 - (D) Pre-empted queue
 - (E) Answer not known
88. Which one is wrong in fully virtualization?
- (A) Unmodified guest OS that works over VMM
 - (B) Not run on top of VMM
 - (C) Relocation of applications
 - (D) Provide compute isolation of different applications
 - (E) Answer not known
89. _____ is a programming model uses for processing huge amounts of data.
- (A) Map reduce map
 - (B) Map reduce work
 - (C) Hadoop name node
 - (D) Map reduce function
 - (E) Answer not known

90. Choose the property of global state in distributed system
- (A) the recorded global state may not be correspond to any of the global state that occurred during the computation
 - (B) system could not have passed through recorded global state
 - (C) A recorded global state is not used for detecting stable properties
 - (D) Both (B) and (C)
 - (E) Answer not known
91. Choose the wrong about splitter in MRMW atomic snapshot object X
- (A) At most one process is returned stop
 - (B) At most $n - 1$ processes are returned down
 - (C) At most $n - 1$ processor are returned right
 - (D) At most $n - 1$ processors are returned top to left
 - (E) Answer not known
92. The cloud model that combines both private and public cloud features is _____.
- (A) Public cloud
 - (B) Private cloud
 - (C) Hybrid cloud
 - (D) Community cloud
 - (E) Answer not known

93. When several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, this situation is called
- (A) Deadlock (B) Starvation
(C) Race condition (D) Semaphore
(E) Answer not known
94. Which deadlock condition occurs: when a set $\{P_0, P_1, \dots, P_n\}$ of waiting processes must exist such that P_0 is waiting for a resource held by P_1 , P_1 is waiting for a resource held by P_2 , ..., P_{n-1} is waiting for a resource held by P_n and P_n is waiting for a resource held by P_0 ?
- (A) Mutual Exclusion (B) Hold and wait
(C) No preemption (D) Circular wait
(E) Answer not known
95. Windows 95, 98, NT, Linux used _____ model of threads in the operating system.
- (A) Many to many model (B) One to many model
(C) Many to one model (D) One to one model
(E) Answer not known

96. Which one of the following is a visual way to determine the deadlock occurrence?
- (A) Resource Allocation graph (B) Starvation graph
(C) Inversion graph (D) Weighted graph
(E) Answer not known
97. The _____ is the additional time for the disk to rotate the desired sector to the disk head.
- (A) Seek time (B) Turn around time
(C) Rotational latency (D) Response time
(E) Answer not known
98. Mirroring refers to
- (A) RAID – 1 (B) RAID – 2
(C) RAID – 3 (D) RAID – 4
(E) Answer not known
99. _____ Memory Allocation allocates the largest hole.
- (A) First Fit (B) Best Fit
(C) Worst Fit (D) Second Fit
(E) Answer not known

100. DTrace is best described as

- (A) Command Line Interface – Uses text commands to allow entering and editing of commands
- (B) Batch Interface – Commands and Directives to control files
- (C) Graphical User Interface – Is a window system with a pointing device to direct I/O
- (D) Compiler
- (E) Answer not known

101. The other name of system programs is

- (A) System Calls
- (B) System Services
- (C) System Applications
- (D) System Utilities
- (E) Answer not known

102. A _____ manages the execution of user programs to prevent errors and improper use of the computer.

- (A) Resource Allocator
- (B) Application Programs
- (C) Control Program
- (D) Workstations
- (E) Answer not known

103. How many states can be processed in operating system?

- (A) 5
- (B) 4
- (C) 3
- (D) 6
- (E) Answer not known

104. In UNIX , which system call creates the new process?
- (A) Fork (B) Create
(C) New (D) First
(E) Answer not known
105. Message passing system allow processes to
- (A) Communicate with each other without sharing the same address space
(B) Communicate with one another by resorting to shared data
(C) Share data
(D) Name the recipient or sender of the message
(E) Answer not known
106. Which type of testing is without access to the source code?
- (A) White-box Testing (B) Black-box Testing
(C) Integration Testing (D) Performance Testing
(E) Answer not known
107. Arrange the following debugging steps in chronological order
- (1) Look for patterns
(2) Form one or more hypotheses
(3) Collect the available information
(4) Implement the appropriate corrections
- (A) (2), (3), (4), (1) (B) (1), (2), (4), (3)
(C) (3), (1), (2), (4) (D) (2), (3), (1), (4)
(E) Answer not known

108. Match the following :

- | | |
|-------------------------|---|
| (a) Unit Testing | 1. Assesses how easy the system is to use |
| (b) Integration Testing | 2. Verifies that a system meets all requirements |
| (c) System Testing | 3. Checks how components interact and work together |
| (d) Usability Testing | 4. Verifies individual components of a system |

- | | (a) | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 2 | 4 | 1 | 3 |
| (B) | 3 | 1 | 4 | 2 |
| (C) | 4 | 3 | 2 | 1 |
| (D) | 1 | 2 | 3 | 4 |
| (E) | Answer not known | | | |

109. In integration testing , the method which integrates all components on a major control path of the program structure is called as _____.

- | | |
|-----------------------------|-------------------------------|
| (A) Top-down integration | (B) Bottom-up integration |
| (C) Depth-first integration | (D) Breadth-first integration |
| (E) Answer not known | |

110. According to validation testing, a software testing is conducted without the presence of software developer is termed as
- (A) Customer acceptance testing
 - (B) Alpha testing
 - (C) Beta testing
 - (D) Recovery testing
 - (E) Answer not known
111. In software project development, the experienced project managers use project scheduling and a control technique while facing severe deadline pressure, that technique is called as _____.
- (A) Concept scoping
 - (B) Time-boxing
 - (C) Scheduling
 - (D) Project tracking
 - (E) Answer not known
112. In project scheduling, a recommended distribution of effort across the software process is often referred to as the _____
- (A) 40–20–40 rule
 - (B) 40–40–20 rule
 - (C) 20–40–40 rule
 - (D) 20–40–20 rule
 - (E) Answer not known
113. COCOMO stands for
- (A) Cost Constructive Model
 - (B) Constructive Cost Model
 - (C) Code Constructive model
 - (D) Constructive Code model
 - (E) Answer not known

114. Which of the following is not an activity of a process framework?
- (A) Communication
 - (B) Construction
 - (C) Management
 - (D) Deployment
 - (E) Answer not known
115. Which software cost estimation technique has the advantage of using it to gain insight into the cost factors within an organization?
- (A) Expert judgement
 - (B) Delphi cost estimation
 - (C) Work breakdown structure
 - (D) Constructive cost model
 - (E) Answer not known
116. ——— design model defines the relationship between major structural elements and patterns of the software.
- (A) Data/ Class Design model
 - (B) Interface Design model
 - (C) Architectural Design model
 - (D) Component Design model
 - (E) Answer not known
117. Software which is divided into separately named and addressable components is generally called as
- (A) Concerns
 - (B) Patterns
 - (C) Modules
 - (D) Elaborations
 - (E) Answer not known

118. “High-level modules should not depend upon low-level modules. Both should depend on abstractions. Abstraction should not depend on details. Details should depend on abstractions”. This statement is stated by _____.
- (A) Oo design concepts
 - (B) Principle of Information hiding
 - (C) Separation of concerns design concept
 - (D) Dependency inversion principle
 - (E) Answer not known
119. In architectural context diagram, the systems that provide data to complete target system functionality is called as _____
- (A) Peer-Level systems
 - (B) Super ordinate systems
 - (C) Subordinate systems
 - (D) Actors
 - (E) Answer not known

120. Match the following

- | | |
|---|------------------------------------|
| (a) The open-closed principle | 1. Abstractions and concretions |
| (b) The Liskov substitution principle | 2. Detector class |
| (c) Dependency inversion principle | 3. Floor plan class |
| (d) The interface segregation principle | 4. Precondition and post condition |

- | | (a) | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 3 | 1 | 2 | 4 |
| (B) | 4 | 3 | 1 | 2 |
| (C) | 2 | 4 | 1 | 3 |
| (D) | 4 | 1 | 3 | 2 |
| (E) | Answer not known | | | |

121. Status Line

Header field (s)

Blank line

Message body

The above formats are of _____

- | | |
|--------------------------|---------------------------|
| (A) HTTP Request Message | (B) HTTP Response Message |
| (C) HTTP Process Message | (D) HTTP Network Message |
| (E) Answer not known | |

122. _____ file is called deployment descriptor in web application development environment
- (A) Web. XML (B) Servlet. Java
(C) Servlet. Class (D) Servlet. Obj
(E) Answer not known
123. The main purpose of the model in MVC is
- (A) Manage data (B) Define routes
(C) Manage user interface (D) Control the view
(E) Answer not known
124. Which method is used to handle GET requests in a servlet?
- (A) do. post () (B) do Get ()
(C) Service () (D) get parameter ()
(E) Answer not known
125. MEAN stack stands for
- (A) Mango DB, Express. js, Angular js, Node. js
(B) Mango DB, Entity Bean, Ajax, Node.js
(C) Meta DB, Entity, Angular js, Node. js
(D) Mango DB, Express, Angular, NOSQL
(E) Answer not known

126. Set Max Age() method used to _____ in cookies
- (A) Set the size of the cookie
 - (B) Specify the expiry time of the cookie
 - (C) Get the value of the cookie
 - (D) Delete the cookie
 - (E) Answer not known
127. Which of the following statements is false about Networking protocols?
- (A) TCP is used for reliable stream-based I/O across network
 - (B) UDP is a point-to-point datagram oriented protocol
 - (C) TCP is expensive than UDP
 - (D) Java does not support both the TCP and UDP protocols
 - (E) Answer not known
128. Which of the following defines several instance methods?
- (A) Server socket
 - (B) Socket
 - (C) InputStream
 - (D) OutputStream
 - (E) Answer not known

129. Which of the following statement is true about Graphics Environment class?
- (A) Manages the display of text on a screen
 - (B) Describes access to a collection of Graphics Device and Font objects
 - (C) Handles drawing lines and shapes
 - (D) Defines the physical dimensions of a screen or printer
 - (E) Answer not known
130. Which layout manager is used by default in Java?
- (A) Border Layout
 - (B) Flow Layout
 - (C) Grid Layout
 - (D) Card Layout
 - (E) Answer not known
131. Which of the following is the Cookie Interface in java.net package?
- (A) Cookie Handler
 - (B) Cookie Manager
 - (C) Cookie Store
 - (D) Http Cookie
 - (E) Answer not known
132. What is the value returned by function compare To() if the invoking string is less than the string compared?
- (A) Value greater than zero
 - (B) Value less than zero
 - (C) Zero
 - (D) One
 - (E) Answer not known

133. The _____ class is a concrete subclass of container.
- (A) Panel
 - (B) Component
 - (C) Frame
 - (D) Graphics
 - (E) Answer not known
134. The _____ of CSS background property allows to piece the background images along the X-axis and Y-axis of the element.
- (A) Background-position
 - (B) Background-repeat
 - (C) Background-attachment
 - (D) Background-image
 - (E) Answer not known
135. Identify the non-breaking space character in HTML.
- (A) bsp
 - (B) &ensp
 - (C) &emsp
 - (D) bps
 - (E) Answer not known
136. PHP stands for
- (A) Hypertext Preprocessor
 - (B) Hypertext Processor
 - (C) Processor Hypertext Point
 - (D) Pre Hypertext Point
 - (E) Answer not known
137. Which method registers a thread in a thread scheduler?
- (A) run ();
 - (B) construct();
 - (C) start();
 - (D) register();
 - (E) Answer not known

138. What will be the result of “abcdef”.substring (2)?
- (A) abc (B) ab
(C) bcdef (D) cdef
(E) Answer not known
139. _____ is a highly optimized set of instructions designed to be executed by the Java run-time system.
- (A) Javacode (B) Bytecode
(C) Bit Steam (D) Byte Steam
(E) Answer not known
140. The operator used to allocate memory for an object in Java is
- (A) malloc (B) calloc
(C) new (D) give
(E) Answer not known
141. The two types of efficiencies that are important for computer algorithms are _____.
- (A) Space efficiency and Time efficiency
(B) Time efficiency and High power efficiency
(C) Higher power efficiency and Computational efficiency
(D) Computational efficiency and space efficiency
(E) Answer not known

142. What is the primary goal of Kruskal's algorithm?
- (A) To find the shortest path between two vertices
 - (B) To find the minimum spanning tree for a connected weighted graph
 - (C) To sort all edges of a graph in descending order
 - (D) To traverse a graph using a depth-first search
 - (E) Answer not known
143. Which of the following algorithms are used to find the shortest path from a source node to all nodes in a weighted graph?
- (A) Breadth First Search
 - (B) Dijkstra's Algorithm
 - (C) Prim's Algorithm
 - (D) Kruskal's Algorithm
 - (E) Answer not known
144. Halting problem of a class P problem is a _____.
- (A) Solvable Problem
 - (B) Unsolvable Problem
 - (C) Decidable Problem
 - (D) Undecidable Problem
 - (E) Answer not known

145. Choose a set of maximization problems among the following
- (i) Knapsack problem
 - (ii) Graph coloring problem
 - (iii) Profit based job assignment problem
 - (iv) Traveling salesman problem
- (A) (ii), (iii) (B) (i), (iv)
(C) (ii), (iv) (D) (i), (iii)
(E) Answer not known
146. A spanning tree contains a connected _____ subgraph.
- (A) Cyclic (B) Acyclic
(C) Adjacent (D) Adjoint
(E) Answer not known
147. The number of edges incident on a vertex in a Graph is called as
- (A) Degree (B) In degree
(C) Order (D) Out degree
(E) Answer not known
148. Which property of a binary tree states whether the key in each node is greater than or equal to the keys in its children?
- (A) Shape property (B) Heap property
(C) Null property (D) Count property
(E) Answer not known

149. From which of the given tree data structures is not a balanced binary tree?
- (A) Splay tree
 - (B) B – tree
 - (C) AVL tree
 - (D) Red-black tree
 - (E) Answer not known
150. All the child nodes of a parent node are referred as
- (A) Neighbor's
 - (B) Siblings
 - (C) Internal nodes
 - (D) Leaf nodes
 - (E) Answer not known
151. Which of the following does not have an complexity of $O(n^2)$?
- (A) Selection
 - (B) Insertion
 - (C) Bubble
 - (D) Merge
 - (E) Answer not known
152. With which of the following algorithm is Pivot element associated
- (A) Binary search
 - (B) Hashing
 - (C) Quick sort
 - (D) Selection sort
 - (E) Answer not known
153. _____ is the sequence of nodes from source node till destination node of a tree.
- (A) Degree
 - (B) Level
 - (C) Depth
 - (D) Path
 - (E) Answer not known

154. Name the graph which is said to be strongly connected if for every pair of distinct vertices v_i, v_j in $v(G)$ and there is a directed path from v_i to v_j and v_j to v_i
- (A) Directed graph (B) Undirected graph
(C) Acyclic undirected graph (D) Horizontal graph
(E) Answer not known
155. A multi-dimensional array A [3] [7] possesses _____ number of elements.
- (A) 3 (B) 7
(C) 10 (D) 21
(E) Answer not known
156. In a _____ linked list, the first and last nodes are connected with each other through the NEXT pointer.
- (A) Singly linked list (B) Doubly linked list
(C) Circular linked list (D) Multi linked list
(E) Answer not known
157. Which of the following situations will occur if a pop operation is performed on an empty stack?
- (A) Overflow (B) Underflow
(C) Array out of bound (D) Exit
(E) Answer not known

158. Before deletion operation from the queue, _____ condition should be checked.

- (A) Overflow
- (B) Underflow
- (C) Front value
- (D) Rear value
- (E) Answer not known

159. Choose not true about Single Linked List

- (A) Dynamic memory allocation
- (B) Static memory allocation
- (C) Each node have atleast one link field
- (D) Determines node is free
- (E) Answer not known

160. Find which node x to be deleted using following procedure

Procedure DDelete (X, L)

//X is node in list L//

if X = L then say “no more node”

else

 RLink (LLink(x)) = RLink (x)

 LLink (RLink(x)) = LLink (x)

 call RET(x)

END

- (A) X should be first node to be deleted
- (B) X should be last node to be deleted
- (C) X is any node in the list
- (D) X is not a node in the list
- (E) Answer not known

161. Identify the example of a distributed system.

- (A) A single-user application running on a laptop
- (B) A bank's ATM network
- (C) A local file system on a computer
- (D) A standalone video game
- (E) Answer not known

162. How does static hashing handle situations where two keys hash to the same bucket?
- (A) It deletes one of the keys
 - (B) It creates a new hash table
 - (C) It uses collision resolution methods like chaining
 - (D) It stores both keys in a special overflow file
 - (E) Answer not known
163. Find the file organization that stores related records of two or more relations in each block.
- (A) Heap file organization
 - (B) Sequential file organization
 - (C) Multitable clustering file organization
 - (D) Hashing file organization
 - (E) Answer not known
164. In a star schema, the central table is called as _____.
- (A) Index table
 - (B) Dimension table
 - (C) Fact table
 - (D) Lookup table
 - (E) Answer not known

165. Among the following find the typical example of a spatial query.
- (A) Retrieve all customer records with a balance greater than Rs. 100
 - (B) Retrieve all employees hired after January 1st, 2020
 - (C) List of all products that are out of stock
 - (D) Find all hotels located within a 10-mile radius of a given point
 - (E) Answer not known
166. Find the primary feature of web database.
- (A) Ability to store large binary files
 - (B) Access via web browsers using HTTP/HTTPs protocols
 - (C) Limited to local network access
 - (D) Requires dedicated hardware for each user
 - (E) Answer not known
167. Apriori is used on which fundamental principle?
- (A) Greedy method
 - (B) Divide and conquer
 - (C) Downward closure property
 - (D) Random sampling
 - (E) Answer not known

168. “_____ which is violated when a relation has undesirable multivalued dependencies and hence can be used to identify and decompose such relations”?
- (A) 1 NF (B) 2 NF
(C) 3 NF (D) 4 NF
(E) Answer not known
169. The advantage of combining related tables in denormalization is _____.
- (A) It increases storage requirements
(B) It improves query performance by reducing the number of joins
(C) It ensures better data consistency
(D) It simplifies data updates and inserts
(E) Answer not known
170. The possible methods to prevent deadlocks in distributed systems are _____.
- (i) Wait – for graph detection
(ii) Timeout – based deadlock detection
(iii) Resource allocation graph
(iv) Distributed lock management
- (A) (ii), (iii) (B) (i), (iv)
(C) (i), (ii), (iii), (iv) (D) (i), (ii), (iii)
(E) Answer not known

171. Which is an indirect functional dependency, where $X \rightarrow Z$ only by virtue of $X \rightarrow Y$ and $Y \rightarrow Z$?
- (A) Join dependency
 - (B) Trivial functional dependency
 - (C) Transitive dependencies
 - (D) Multivalued dependencies
 - (E) Answer not known
172. If a functional dependency $A \rightarrow B$ holds, which of the following is true?
- (A) A and B are the same attributes
 - (B) A can be determined from B
 - (C) A must be the primary key
 - (D) If two tuples have the same value for A, they must have the same value for B
 - (E) Answer not known
173. "A relation schema R is in _____ if it satisfies 2 NF and no nonprime attribute of R is transitively dependent on the primary key".
- (A) 1 NF
 - (B) 2 NF
 - (C) 3 NF
 - (D) 4 NF
 - (E) Answer not known

174. The ACID properties are

- (A) Atomicity, Consistency, Isolation, Durability
- (B) Advance, Correspondence, Identity, Deadlock
- (C) Alternate, Corresponding, Isolation, Duration
- (D) Atomic, Character, Integer, Data
- (E) Answer not known

175. “A child may have marry parent nodes”.

Which type of data model of the above statement?

- (A) Hierarchical model
- (B) Relational model
- (C) Network model
- (D) Object model
- (E) Answer not known

176. _____ interact with the system without writing programs?

- (A) Specialized end users
- (B) System Analysts
- (C) Naive end users
- (D) Sophisticated end users
- (E) Answer not known

177. _____ symbol is used to represent the “projection” operation in Relational algebra?

- (A) σ (sigma)
- (B) π (pi)
- (C) $\bowtie$ (bowtie)
- (D) $\cup$ (union)
- (E) Answer not known

178. Consider the following statements about normalization and BCNF :
- Statement 1 : If a relation is in BCNF, it is also in 3NF.
- Statement 2 : A relation in BCNF can have partial dependencies.
- (A) Statement 1 is true, Statement 2 is false.
- (B) Statement 1 is false, Statement 2 is true.
- (C) Both Statements are true.
- (D) Both Statements are false.
- (E) Answer not known
179. An _____ represents a real world concept or object, such as an employee or a project from the miniworld that is described in the database.
- (A) Attribute (B) Relationship
- (C) Data model (D) Entity
- (E) Answer not known
180. What are the basic concepts of E-R model?
- (A) Data, Database, Database Management System
- (B) Entity, Attribute, Relationship
- (C) Row, Column, Table
- (D) File, Record, Book
- (E) Answer not known

181. A _____ of a finite set of elements S is an ordered sequence of all the elements of S, with each element appearing exactly once.
- (A) Combination (B) Permutation
(C) Factorization (D) Rearranging
(E) Answer not known
182. _____ is an example for active attack in Network security.
- (A) Traffic Analysis
(B) Release of message contents
(C) Denial of service
(D) Router Analysis
(E) Answer not known
183. Hashed message is signed by a sender using his
- (A) Public key (B) Private key
(C) Receiver's private key (D) Receiver's public key
(E) Answer not known
184. The _____ is the central node of 802.11 wireless operations.
- (A) Access point (B) Access port
(C) WPA (D) WAP
(E) Answer not known

185. What is the purpose of a Digital signature?
- (A) To encrypt data for confidentiality
 - (B) To implement public-key encryption
 - (C) To hide the sender's identity
 - (D) To verify authenticity and integrity of a message
 - (E) Answer not known
186. In IP security, each SPD entry is defined by a set of IP and upper-layer protocol field values called _____.
- (A) Attributes
 - (B) Selectors
 - (C) Addresses
 - (D) Nodes
 - (E) Answer not known
187. In Data Encryption Algorithm (DEA), data are encrypted in 64-bit blocks using a 56-bit key to produce _____ length output.
- (A) 56 bit
 - (B) 64 bit
 - (C) 32 bit
 - (D) 128 bit
 - (E) Answer not known

188. Match the following technologies :

- | | |
|----------------|--|
| (a) HTML | 1. To let programs exchange application data with the server |
| (b) DOM | 2. To present information as pages |
| (c) XML | 3. To change parts of pages while they are viewed |
| (d) Javascript | 4. To bind all the functionality together |

- | | (a) | (b) | (c) | (d) |
|-----|------------------|-----|-----|-----|
| (A) | 3 | 2 | 4 | 1 |
| (B) | 4 | 1 | 3 | 2 |
| (C) | 1 | 4 | 3 | 2 |
| (D) | 2 | 3 | 1 | 4 |
| (E) | Answer not known | | | |

189. SOAP stand for _____.

- (A) Simple Object Access Protocol
- (B) Secure Object Access Protocol
- (C) Simple Open Access Protocol
- (D) Simple Object Attribute Protocol
- (E) Answer not known

190. Which modulation scheme is used by Bluetooth?

- | | |
|----------------------|----------|
| (A) MSK | (B) BPSK |
| (C) DQSK | (D) GFSF |
| (E) Answer not known | |

191. Identify the correct matching between the given OSI layers and their functionalities.

OSI Layer		Functionalities
(a)	Network Layer	1. Packet routing
(b)	Transport Layer	2. Framing and error control
(c)	Data Link Layer	3. Host-to-Host communication

- | | | | |
|-----|------------------|-----|-----|
| | (a) | (b) | (c) |
| (A) | 1 | 3 | 2 |
| (B) | 1 | 2 | 3 |
| (C) | 3 | 1 | 2 |
| (D) | 3 | 2 | 1 |
| (E) | Answer not known | | |

192. The _____ uses the idea to spread the spectrum using orthogonal codes.

- | | |
|----------------------|----------|
| (A) FDMA | (B) CDMA |
| (C) TDMA | (D) SDMA |
| (E) Answer not known | |

193. The _____ is mainly used to simplify the installation and maintenance of networked computers.

- | | |
|----------------------|----------|
| (A) ICMP | (B) DHCP |
| (C) IP | (D) TCP |
| (E) Answer not known | |

194. Which of the following is not error-correcting codes?
- (A) Hamming codes
 - (B) Binary convolutional codes
 - (C) Read-Write codes
 - (D) Reed-Solomon codes
 - (E) Answer not known
195. ARP stands for _____.
- (A) Address Routing Protocol
 - (B) Address Routing Packet
 - (C) Address Routing Program
 - (D) Address Resolution Protocol
 - (E) Answer not known
196. A subset of a network that includes all the routes but contains no loops is called
- (A) AVL tree
 - (B) Spanning tree
 - (C) Spark tree
 - (D) Tries
 - (E) Answer not known
197. At the CRC generator, _____ added to the data unit before the division process.
- (A) 0s are
 - (B) 1s are
 - (C) a CRC remainder is
 - (D) a polynomial is
 - (E) Answer not known

198. The Checksum field in TCP header is _____.
- (A) Two's complement of sum of header in 16 bits
 - (B) One's complement of sum of header and data in bytes
 - (C) One's complement of sum of header, data and pseudo header in 16 bit words
 - (D) Two's complement of sum of header and data in bytes
 - (E) Answer not known
199. The message 11001001 is to be transmitted using the CRC polynomial $x^3 + 1$ to protect it from errors. The message that should be transmitted is _____.
- (A) 11001010
 - (B) 11001001000
 - (C) 11001001010
 - (D) 11001001011
 - (E) Answer not known
200. In _____ ARQ, if a NAK is received only, the specific damaged or lost frame is retransmitted.
- (A) Go-back-n
 - (B) Stop-and-wait
 - (C) Selective-reject
 - (D) (A) and (B)
 - (E) Answer not known
-