H.T No										

Sreenidhi Institute of Science and Technology
(An Autonomous Institution)

Regulations: A20

Code No: 8E479 **Date:27-July-2022 (FN)**

B.Tech II-Year II- Semester External Examination, July- 2022 (Regular)
COMPREHENSIVE TEST AND VIVA VOCE-IV (CSE)

Time: 3:00 Hours **Max.Marks:70**

Note: Answer Any 70 Questions.
Student can solve more than 70 questions, but maximum 70 marks will be awarded.
Calculator's are not allowed.

S.No	Question

1. $\sum_{1 \le k \le n} O(n)$, where O(n) stands for order n is:
   a.) O(n) b.) $O(n^2)$ c.) $O(n^3)$ d.)$O(3n^2)$
2. The time complexity of the following C function is (assume n > 0)

```
int recursive(int n){
 if(n == 1){
   return (1);
 }
 return (recursive(n - 1) + recursive(n - 1));
}
```

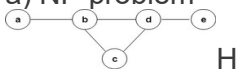
   a.)O(n) b.)O(n log n) c.) $O(n^2)$ d.)$O(2^n)$
3. Which of the following is false?
   A) 100 n log n = O((n log n)/100) B. √log n = O(log log n)
   C. if 0 < x < y then n^x = O(n^y) D. $2^n \neq O(n^k)$
4. The concatenation of two lists is to be performed in O(1) time. Which of the following implementations of a list should be used?
   A) Singly Linked List B) Doubly Linked List
   C) Circular Doubly Linked List D) Array implementation of List
5. A sorting technique is called stable if:
   a) Takes O(nlogn) times
   b) Maintains the relative order of occurrence of non-distinct elements
   c) Uses divide-and-conquer paradigm d) Takes O(n) space
6. Merge sort uses
   a) Divide-and-conquer b) Backtracking c) Heuristic approach d) Greedy approach
7. Which of the following statements is true?
   I. As the number of entries in a hash table increases, the number of collisions increases.
   II. Recursive programs are efficient
   III. The worst case complexity for Quicksort is $O(n^2)$
   IV. Binary search using a linear linked list is efficient.
   a) I and II b.)II and III c.) I and IV d.) a and III
8. Which of the following is not a stable sorting algorithm?
   a) Insertion sort b) Selection sort c) Bubble sort d) Merge sort
9. Fractional knapsack problem is also known as _____
   a) 0/1 knapsack problem b) Continuous knapsack problem
   c) Divisible knapsack problem d) Non continuous knapsack problem
10. Indicate the runtime of Dijkstra's algorithm when the implementation is based on a binary heap. (E = edges; V = vertices)
    A. O(ElogV) B. $O(V^2)$ C. O(E + VlogV) D. O(E + V)
11. To implement Dijkstra's shortest path algorithm on unweighted graphs so that it runs in linear time, the data structure to be used is:
    A. Stack B. Heap C. Queue D. Binary Tree
12. Dijkstra's algorithm is based on which paradigm?
    A - Greedy paradigm B - Backtracking paradigm
    C - Dynamic Programming paradigm D - Divide and Conquer paradigm
13. State the time efficiency of floyd's algorithm
    a) $O(n^2)$ b) O(nlogn) c) $O(n^3)$ d) O(n)

14. Which of the following are the properties of Dynamic Programming
a)Evolutionary Approach b) Greedy Approach
c)Requires more Time d) Optimal Substructure and Overlapping Subproblems.

15. In dynamic programming, the technique of storing the previously calculated values is called
a) Saving value property b) Storing value property c) Memoization d) Mapping

16. Four matrices M1, M2, M3 and M4 of dimensions pxq, qxr, rxs and sxt respectively can be multiplied is several ways with different number of total scalar multiplications. For example, when multiplied as ((M1 X M2) X (M3 X M4)), the total number of multiplications is pqr + rst + prt. When multiplied as (((M1 X M2) X M3) X M4), the total number of scalar multiplications is pqr + prs + pst. If p = 10, q = 100, r = 20, s = 5 and t = 80, then the number of scalar multiplications needed is
a)19000 b) 24000 c)18000 d)21000

17. Hamiltonian path problem is _____
a) NP problem b) N class problem c) P class problem d) NP complete problem

18. 

How many Hamiltonian paths in this graph_____
a)1 b) 2 c)3 d)O(n)4

19. _____is the solution for 4 –Queens Problem
a)1- 2-4-3 b) 2 -4-1-3 c)3-1-2-4 d)3-2-1-4

20. In what manner is a state-space tree for a backtracking algorithm constructed?
a) Depth-first search b) Breadth-first search c) Twice around the tree d) Nearest neighbour first

21. Choose the correct answer for the following statements:
I. The theory of NP–completeness provides a method of obtaining a polynomial time for NP algorithms.
II. II. All NP-complete problem are NP-Hard.
a) I is FALSE II is TRUE b) I is TRUE II is FALSE c) Both TRUE d)Both FALSE

22. The time taken by Non Deterministic sorting algorithm is
a)O(n) b) $O(n^2)$ c)O(1) d)O(logn)

23. A problem in NP is NP-complete if
a) It can be reduced to the 3-SAT problem in polynomial time
b) The 3-SAT problem can be reduced to it in polynomial time
c) It can be reduced to any other problem in NP in polynomial time
d) some problem in NP can be reduced to it in polynomial time

24. The following are the statements regarding the NP problems.
Chose the right option from the following options:
I. All NP-complete problems are not NP-hard.
II. Some NP-hard problems are not known to be NP-complete.
a) I is FALSE II is TRUE b) I is TRUE II is FALSE c) Only II is TRUE d)Only I is TRUE

25. Generic Process Framework Activities are
a) Communication, Planning, Modeling, Testing and Debugging
b) Communication, Planning, Modeling,Constraction and Debugging
c) Communication, Planning, Modeling, Constraction and Deployment
d) Communication, Planning, Modeling, Testing and Deployment

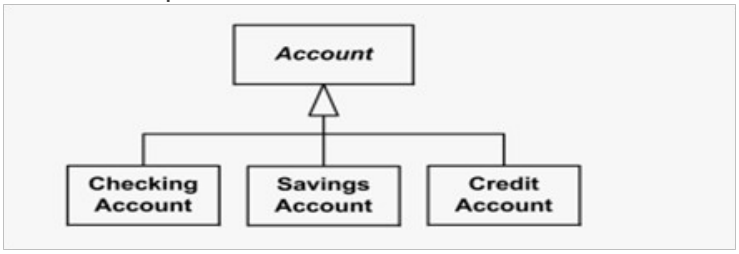
26. . CMMI Stands for
a)Capability Maturity Model Interface b) Capability Maturity Model Interaction
c) Capacity Maturity Model Interface d) Capability Maturity Model Integration

27. Software characteristics are
a) functionality,reliability,efficiency & portability b) user requirement,system requirement
c) functional,non-functional & system requirement d)adaptability,testing & development

28. Define software ?
a) hardware & software b) instruction,data structure & documents
c) instruction,database & development d)database,development & testing

29. Interaction Diagrams are
a) Class & Use case b) Sequence & Collaboration
c) Component & Deployment d) Sequence & State chart

30. below example for-



a)Dependencies b)Association c) Generalization d) Realization

31. UML stands for
a) unified method language b) universal method language
c)unified modeling language d) universal modeling language

32. Conceptual model of the UML categorized
a) diagrams, relationship & common mechanisms b) Building blocks, Rules & common mechanisms
c) Building blocks, diagrams & relationship d)Rules, objects & class

33. Iterative process Models are
a) Waterfall b)Incremental, RAD c) Concurrent d) 4 GT

34. Evolutionary Process Models are
a) RAD, Waterfall b) Waterfall, Incremental c) Spiral, Prototype d) Incremental, RAD

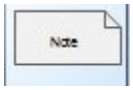
35. RAD Stands for
a) Read Access Development b)Rapid Application Development
c) Random Access Document d)Rapid Access Development

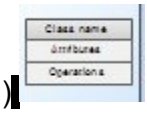
36. Types of Requirements are
a) user,system,functional & non-functional b) privancy,safety,performances
c) delivery,usability,performances d)functional,privancy,safety

37. class diagram consists of
a) name,attributes,operations b) name,functions,relationship
c) name,operations,diagrams d)attributes,operations,relationship

38. Common modeling technique for class diagram
a)simple collaboration,simple operation,simple workflow
b) simple collaboration,logical database sehema,forword & reverse engineering
c) simple operation,simple workflow d) forword & reverse engineering,simple workflow

39. Class-diagram symbol is

a) 

b) 
c) 
d) 

40. What is forward & reverse engineering
a)UML to JAVA,UML to UML b) UML to UML,JAVA to UML
c) UML to JAVA, JAVA to UML d) C to C++,JAVA to UML

41. Interaction diagram are
a)sequence & object b) object & activity c)sequence & collaboration d)component & depolyment

42. Dynamic diagrams are
a)class & use case b) object & class c) component & depolyment d)activity & statechart

43. 

Above Message Symbol
a) synchronous message b) asynchronous message c) return message d)self-message

44. Sequence diagram is
a) the object that send & receice message b) control-flow message
c) activity to activity d) time-ordering of message

45. Statechart diagram consist of
a) operations,methods,class b) attributes,objects,component
c) states,transitions,events d) class,attributes,operations

46. Event categorized into
a) signals,call,time & change state b) time,space,speed & distance
c)actions,objects,class & methods d)actions,objects,interface & methods

47. 

Above diagram is
a) transition b) decision c) fork d)join

48. External events are those that pass between
a)user & object b) system & actors c) class & instances d)object & system

49. In the relational modes, cardinality is termed as:
(A)Number of tuples. (B) Number of attributes.
(C) Number of tables. (D) Number of constraints.

50. Relational calculus is a
(A) Procedural language. (B) Non- Procedural language.
(C) Data definition language. (D) High level language.

51. The view of total database content is
(A) Conceptual view (B) Internal view. (C) External view. (D) Physical View.

52. Cartesian product in relational algebra is
(A) A Unary operator. (B) A Binary operator. (C) A Ternary operator. (D) Not defined.

53. An entity set that does not have sufficient attributes to form a primary key is a
(A) strong entity set. (B) weak entity set. (C) simple entity set. (D) primary entity set.

54. In a Hierarchical model records are organized as
(A)Graph. (B) List. (C) Links. (D) Tree.

55. In an E-R diagram attributes are represented by
A) rectangle. (B) square. C) ellipse. (D) triangle.

56. In case of entity integrity, the primary key may be
A) not Null (B) Null (C) both Null & not Null. (D) any value.

57. A report generator is used to
(A) update files. (B) print files on paper. (C) data entry. (D) delete files.

58. The property / properties of a database is / are :
(A) It is an integrated collection of logically related records.
(B) It consolidates separate files into a common pool of data records.
(C) Data stored in a database is independent of the application programs using it.
(D) All of the above.

59. The DBMS language component which can be embedded in a program is
(A) The data definition language (DDL). (B) The data manipulation language (DML).
(C) The database administrator (DBA). (D) A query language.

60. A relational database developer refers to a record as
(A) a criteria. (B) a relation. (C) a tuple. (D) an attribute.

61. An advantage of the database management approach is
(A) data is dependent on programs. (B) data redundancy increases.
(C) data is integrated and can be accessed by multiple programs. (D) none of the above.

62. A DBMS query language is designed to
(A) support end users who use English-like commands.
(B) support in the development of complex applications software.
(C) specify the structure of a database. (D) all of the above.

63. Transaction processing is associated with everything below except
(A) producing detail, summary, or exception reports. (B) recording a business activity.
(C) confirming an action or triggering a response. (D) maintaining data.

64. It is possible to define a schema completely using
(A) VDL and DDL. (B) DDL and DML.
(C) SDL and DDL. (D) VDL and DML.

65. produces the relation that has attributes of R1 and R2

(A) Cartesian product (B) Difference (C) Intersection (D) Product

66. The file organization that provides very fast access to any arbitrary record of a file is
(A)Ordered file (B) Unordered file (C) Hashed file (D) B-tree

67. DBMS helps achieve
(A) Data independence (B) Centralized control of data
(C) Neither (A) nor (B) (D) both (A) and (B)

68. Which of the following are the properties of entities?
(A) Groups (B) Table (C) Attributes (D) Switchboards

69. In a relation
(A) Ordering of rows is immaterial (B) No two rows are identical
(C) (A) and (B) both are true (D) None of these.

70. Which of the following operation is used if we are interested in only certain columns of a table?
(A) PROJECTION (B) SELECTION (C) UNION (D) JOIN

71. In tuple relational calculus 2 1 P P → is equivalent to
A) 2 1 P P ∨ ¬ (B) 2 1 P P ∨ (C) 2 1 P P ∧ (D) 2 1 P P ¬ ∧

72. The relational model feature is that there
(A) is no need for primary key data.
(B) is much more data independence than some other database models.
(C) are explicit relationships among records. (D) are tables with many dimensions.

73. Convert the binary number 1100.1011 to decimal.
a) 12.6875 b) 10.75 c) 9.3125 d) all

74. Convert (BBB)16 = ( )10
a) 303 b) 3003 c) 6008 d) all

75. Simplify the Boolean expression Y = A' B' C + A' B C +A B' C + A B C
a) A +B b) B c) C d) A(B+C)

76. Total cells required for simplify the given expression using K-map Y = ∑ (0, 1,2, 3, 4, 5,7,6,14)
a) 16 b) 8 c) 160 d) 0

77. Half adder adds --- binary bits.
a) 2 b) 3 c) 4 d) 5

78. Data select lines required for 4:1 Multiplexer
a) 5 b) 4 c) 16 d) 2

79. A flip-flop is also called as
a) Bistable b) Monostable c) Astable d) None

80. The Race around condition occurs in … flip-flop
a) D-flip-flop b) SR- flip-flop c) JK flip-flop d) all

81. A Ripple counter is --- sequential circuit
a) Asynchronous b) Synchronous c) both d) none

82. The minimum number of Flip-Flops are required for a Decade counter is
a) 10 b) 3 c) 4 d) none

83. In 16x8 memory chip --- data lines are required.
a) 4 b) 8 c) 12 d) 16

84. The number of address lines required for 32 memory locations
a) 2 b) 4 c) 5 d) 8

85. A random variable has the following probability function

x:	-2	-1	0	1	2	3
y:	0.1	k	0.2	2k	0.3	k

Find the value of k
(a) 0.1 (b) 0.2 (c) 0.6 (d) 0.8

86. If k is a constant then E(x+k) =
(a) E(x) (b) E(x)+k (c) E(x)-k (d) $\frac{E(x)+k}{2}$

87. A sample is said to be large if n >
(a) 20 (b) 30 (c) 40 (d) 60

88. N objectives can be selected out of N objects with out replacement in _ways.
(a) NC_n (b) N^n (c) n^N (d) $\angle N$

89. A hypothesis which is complementary to Null hypothesis is known as hypothesis
(a) Null (b) Imaginary (c) Creative (d) Alternative

90. An error obtained by rejecting Ho when Ho is true is known as_____ error
(a) Small (b) Type I (c) Type II (d) Big

91. The test statistic for chi- square -test is = _____
(a) $\sum \frac{oi}{Ei}$ (b) $\sum \frac{oi-Ei}{Ei}$ (c) $\sum \frac{oi-Ei}{oi}$ (d) $\sum \frac{(oi-Ei)^2}{Ei}$

92. In φ^2 - test the df without estimating population parameters from sample statistics is r
(a) n (b) k-1 (c) K (d) k + 1

93. If the karl pearson's correlation coefficient r is equal to 1 then
A)there is a positive relationship between two variables
B)there is a negative relationship between two variables
C)there is a perfect positive relationship between two variables
D)there is no relationship between two variables

94. The equation of multiple regression of z on x and y is _____
(a) z=x+ay (b) z=x (c) $z^2=x^2+y^2$ (d) z=a+bx+cy

95. Which subject studies the behavior of the firm in theory and practice?
a) Micro Economics b) Macro Economics c) Managerial Economics d) Welfare Economics

96. Which cost is the additional cost to produce an additional unit of output?
a) Incremental b) Sunk c) Marginal d) Total

97. Accounting is the language of?
a)Finance b) Business c) Profit d) Dividend

98. Balance sheet is prepared to know?
a) Profit b) Loss c) Financial position d) All

99. Which is considered as getting things done through the people?
a) Business b) organization c)Management d) Firm

100. Which is called the understanding, prediction & management of human behavior?
a) Psychology b) sociology c) Organization behavior d) Economics

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