1. A table is in the ..... if only candidate keys are the determinants.

A) functional dependency
B) transitive dependency
C) 4 NF
D) BCNF

Answer: D

2. A table on the many side of a one to many or many to many relationship must:

A) Be in Second Normal Form (2NF)
B) Be in Third Normal Form (3NF)
C) Have a single attribute key
D) Have a composite key

Answer: D

3. A three digit decimal number requires _____ for representation in the conventional BCD format.

A) 3 bits
B) 6 bits
C) 12 bits
D) 24 bits

Answer: C
Explanation: The number of bits needed to represent a given decimal number is always greater than the number of bits required for a straight binary encoding of the same. Hence, a three digit decimal number requires 12 bits for representation in BCD format.

4. A transaction processing system is also called as .....…

A) processing monitor
B) transaction monitor
C) TP monitor
D) monitor

Answer:

5. A variant of the linked list in which none of the node contains NULL pointer is?

A) Singly linked list
B) Doubly linked list
C) Circular linked list
D) None

Answer: C

6. A weak entity type always has a _____ participation constraint with respect to its identifying relationships.

A) Partial
B) Total
C) Overlap
D) Disjoint

Answer: B

7. A weak entity type normally has a _____ key.

A) Partial
B) Total
C) Super

D) Strong

Answer: A

Explanation: A weak entity type normally has a partial key, which is a set of attribute that can uniquely identify weak entities that are related to same owner entity. Assuming that two support documents of a voucher do not have the same document Id, the said Id can be a good partial key.

8. Access time of a binary search tree may go worse in terms of time complexity upto

A) n pow 2
B) (n log n)
C) n
D) 1

Answer: C

9. According to Boolean algebra Involution law (x')'=? Is equal to

A) X'
B) X
C) 1
D) 0

Answer: B

10. Addressing structure

A) defines the fundamental method of determining effective operand addresses
B) are variations in the use of fundamental addressing structures, or some associated actions which are related to addressing.
C) performs indicated operations on two fast registers of the machine and leave the result in one of the registers.
D) all of the above

Answer: A

11. Advantage of a multi-dimension array over pointer array

A) Pre-defined size.
B) Input can be taken from user.
C) Faster Access.
D) All of the mentioned

Answer: D

12. After the crash of a disk containing the database, which of the following tools will need to be used for recovery?

A) Database backup
B) Log
C) Checkpoint table
D) All of the above

Answer:

13. After the nodes are prepared, the distributed transaction is said to be .....

A) in-doubt
B) in-prepared
C) prepared transaction
D) in-node

Answer: A

14. ALLOCATION OF MEMORY TO OBJECTS AT THE TIME OF THEIR CONSTRUCTION IS KNOWN AS ..... OF OBJECTS.

A) RUN TIME CONSTRUCTION
B) DYNAMIC CONSTRUCTION
C) INITIAL CONSTRUCTION
D) STATIC CONSTRUCTION

Answer: B

15. AN ..... WITH A CONSTRUCTOR OR DESTRUCTOR CANNOT BE USED AS A MEMBER OR A UNION.

A) CLASS
B) OBJECT
C) FUNCTION
D) VARIABLE

Answer: B

16. An 8x3 encoder has how many output wires

A) 2
B) 3
C) 8
D) 11

Answer: B

17. 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.

Answer: B

18. An entity type without a key attribute is called _____ entity type.

A) Null
B) Weak
C) Strong
D) Single

Answer: B
Explanation: Entities types, which do not have identifier (or key attributes) of their own are, called weak entity types. Such entity types are identified by related to specific entities from another entity type in combination with some of their attribute value.

19. An invalid condition in the operation of an active-HIGH input S-R latch occurs when _____.

A) HIGHs are applied simultaneously to both inputs S and R
B) LOWs are applied simultaneously to both inputs S and R
C) a LOW is applied to the S input while a HIGH is applied to the R input
D) a HIGH is applied to the S input while a LOW is applied to the R input

Answer: A

20. An operator function is created using _____ keyword.

A) Iterator
B) Allocator
C) Constructor
D) operator

Answer: D

21. Applications of multidimensional array are?

A) Matrix-Multiplication
B) Minimum Spanning Tree
C) Finding connectivity between nodes
D) All of the mentioned

Answer: D

22. Array is basically

A) Collection of numbers only
B) Collection of ascii values only
C) Collection of Homogeneous data types
D) Collection of Heterogeneous data types

Answer: C

23. As disks have relatively low transfer rates and relatively high latency rates, disk schedulers must reduce latency times to :

A) Ensure high bandwidth
B) Ensure low bandwidth
C) Make sure data is transferred
D) Reduce data transfer speeds

Answer: A

24. As the bank audit transaction reads Mary's savings balance, $100, Mary transfers $50 to her checking, making it $250, and the audit transaction completes with the combined value of $350 in both accounts. This is called:

A) An uncommitted dependency
B) An incorrect summary
C) A lost update
D) A data entry error

Answer:

25. Assume that an integer and a pointer each takes 4 bytes. Also, assume that there is no alignment in objects. Predict the output following program.

```
#include<iostream>
using namespace std;
class Test
{
        static int x;
        int *ptr;
        int y;
};
int main()
{
        Test t;
        cout << sizeof(t) << " ";
        cout << sizeof(Test *);
}
```

A) 12 4
B) 12 12
C) 8 4
D) 8 8

Answer: C
Explanation: For a compiler where pointers take 4 bytes, the statement "sizeof(Test *)" returns 4 (size of the pointer ptr). The statement "sizeof(t)" returns 8. Since static is not associated with each object of the class, we get (8 not 12).

26. Assume that the size of char is 1 byte and negatives are stored in 2's complement form

```
#include<stdio.h>
int main()
{
        char c = 125;
        c = c+10;
        printf("%d", c);
        return 0;
}
```

A) 135
B) +1NF
C) -121
D) -8

Answer: C
Explanation: 125 is represented as 01111101 in binary and when we add 10 i.e 1010 in binary it becomes : 10000111. Now what does this number represent?
Firstly, you should know that char can store numbers only -128 to 127 since the most significant bit is kept for sign bit. Therefore 10000111 represents a negative number. To check which number it represents we find the 2's complement of it and get 01111001 which is = 121 in decimal system. Hence, the number 10000111 represents -121.

27. Attribute of a table is refers to as____ in relational model
A) Record
B) Column
C) Tuple
D) Key
Answer: B

28. Attributes that are not divisible are called _____.
A) Composite
B) Atomic
C) Complex
D) Structured
Answer:

29. Avoid placing attributes in a base relation whose values may frequently be
A) Null
B) Multiple
C) Single
D) Repeated
Answer:

30. Avoid relations that contain matching attributes that are not ____ combinations
A) foreign key, primary Key
B) Null value, primary key
C) foreign key, Candidate Key
D) Candidate key, primary Key

Answer:

31. Backward recovery is which of the following?

A) Where the before-images are applied to the database
B) Where the after-images are applied to the database
C) Where the after-images and before-images are applied to the database
D) Switching to an existing copy of the database

Answer: A

32. BCD to seven segment conversion is a _____

A) Decoding process
B) Encoding process
C) Comparing process
D) None of the mentioned

Answer: A

33. Because of virtual memory, the memory can be shared among

A) Processes
B) Threads
C) Instructions
D) None of the mentioned

Answer: A

34. Binary code that distinguishes ten elements must contain at least

A) Two bits
B) Three bits
C) Four bits
D) Five bits

Answer: C

35. Binary coded decimal is a combination of

A) Two binary digits
B) Three binary digits
C) Four binary digits
D) None of the mentioned

Answer: C
Explanation: Binary coded decimal is a combination of 4 binary digits. For example-8421.

36. Binary search algorithm can not be applied to

A) sorted linked list
B) sorted binary trees
C) sorted linear array
D) pointer array

Answer: A

37. Can member functions of one class be friend functions of another class?

A) Yes
B) No

Answer: A

38. Carry out BCD subtraction for (68) – (61) using 10's complement method.

A) 00000111
B) 01110000
C) 100000111
D) 011111000

Answer: A

Explanation: First the two numbers are converted into their respective bcd form using 8421 sequence. then binary subtraction is carried out.

39. Choose most appropriate statement

A) An abstract base class can have pure virtual destructor
B) An abstract base class can have only virtual destructor
C) An abstract base class can have non virtual destructor
D) An abstract base class cannot have destructor

Answer: D

40. Choose the most appropriate choice with respect to conceptual design.

A) Conceptual design is a documentation technique. Once the relation schemes are defined one can draw E-R diagrams from the relation schemes for documentation
B) Conceptual design needs data volume and processing frequencies to determine the size of the database
C) Output of any conceptual design is an E-R diagram
D) Conceptual design involves modeling the data requirements independent of the DBMS, operating system and the hardware.

Answer: D

41. Closure of Y is denoted as

A) Y*
B) Y->X
C) Y+
D) None of the above

Answer:

42. Collection of information stored in database at particular instance of time is called as _____.

A) Data Structure
B) Database Schema
C) Instance of Database
D) Objects in Database

Answer: C

Explanation: Oracle work on the instance basis, whatever the operation related to Oracle is only on instance level.

43. Comment on the following statement: int (*A.[7];

A) An array a of pointers
B) A pointer a to an array
C) A ragged array
D) None

Answer: B

44. Comment on the output of this C code?

```
int main()
{
        int a[5] = {1, 2, 3, 4, 5};
        int i;
        for (i = 0; i < 5; i++)
        if ((char)a[i] == '5')
        printf("%d\n", a[i]);
        else
        printf("FAIL\n");
}
```

A) The compiler will flag an error
B) Program will compile and print the output 5
C) Program will compile and print the ASCII value of 5
D) Program will compile and print FAIL for 5 times

Answer: D

45. Commit and rollback are related to .....…

A) data integrity
B) data consistency
C) data sharing
D) data security

Answer: B

46. Consider a directed line(->) from the relationship set advisor to both entity sets instructor and student. This indicates _____ cardinality

A) One to many
B) One to one
C) Many to many
D) Many to one

Answer: B

47. Consider a schema R(A, B, C, D) and functional dependencies A -> B and C -> D. Then the decomposition of R into R1 (A, B) and R2(C, D) is

A) dependency preserving and lossless join
B) lossless join but not dependency preserving
C) dependency preserving but not lossless join
D) not dependency preserving and not lossless join

Answer: C

Explanation: Dependency Preserving Decomposition:
Decomposition of R into R1 and R2 is a dependency preserving decomposition if closure of functional dependencies after decomposition is same as closure of of FDs before decomposition. A simple way is to just check whether we can derive all the original FDs from the FDs present after decomposition.

In the above question R(A, B, C, D) is decomposed into R1 (A, B) and R2(C, D) and there are only two FDs A -> B and C -> D. So, the decomposition is dependency preserving

Lossless-Join Decomposition:
Decomposition of R into R1 and R2 is a lossless-join decomposition if at least one of the following functional dependencies are in F+ (Closure of functional dependencies)

R1 ∩ R2 → R1
OR
R1 ∩ R2 → R2
In the above question R(A, B, C, D) is decomposed into R1 (A, B) and R2(C, D), and R1 ∩ R2 is empty. So, the decomposition is not lossless.

48. Consider a weight balanced tree such that, the number of nodes in the left sub tree is at least half and at most twice the number of nodes in the right sub tree. The maximum possible height (number of nodes on the path from the root to the farthest leaf) of such a tree on k nodes can be described as

A) log2 n
B) log4/3 n
C) log3 n
D) log3/2 n

Answer: D
The number of nodes in the left subtree is at least half and at most twice the number of nodes in the right subtree.
Total number of nodes can be described by the recurrence
T(n) = T{(n-1)/3} + T{2(n-1)/3} + 1 T(1) = 1.
Height of the tree will be H(n) = H{2/3(n-1)} + 1, H(1).
Drawing a recurrence tree and the cost at each level is 1 and the height will be log(3/2)n.
So the correct answer is option D.

49. Consider an implementation of unsorted doubly linked list. Suppose it has its representation with a head pointer and tail pointer. Given the representation, which of the following operation can be implemented in O(1) time?

i) Insertion at the front of the linked list
ii)Insertion at the end of the linked list
iii)Deletion of the front node of the linked list
iv)Deletion of the end node of the linked list

A) I and II
B) I and III
C) I,II and III
D) I,II,III and IV

Answer: D

50. Consider an implementation of unsorted doubly linked list. Suppose it has its representation with a head pointer only. Given the representation, which of the following operation can be implemented in O(1) time?

i) Insertion at the front of the linked list
ii) Insertion at the end of the linked list
iii) Deletion of the front node of the linked list
iv) Deletion of the end node of the linked list

A) I and II
B) I and III
C) I,II and III
D) I,II,III and IV

Answer: B

51. Consider an implementation of unsorted singly linked list. Suppose it has its representation with a head pointer only.Given the representation, which of the following operation can be implemented in O(1) time?

i) Insertion at the front of the linked list
ii) Insertion at the end of the linked list
iii) Deletion of the front node of the linked list
iv) Deletion of the last node of the linked list

A) I and II
B) I, II and IV
C) I, II and III
D) I and III

Answer: D

52. Consider linked list is used to implement the Stack then which of the following node is considered as Top of the Stack ?

A) Any Node
B) Last Node
C) First Node
D) Middle Node

Answer:

53. Consider money is transferred from (1)account-A to account-B and (2) account-B to account-A. Which of the following form a transaction ?

A) Only 1
B) Only 2
C) Both 1 and 2 individually
D) Either 1 or 2

Answer: C
Explanation: The term transaction refers to a collection of operations that form a single logical unit of work.

54. Consider the following combinational function block involving four Boolean variables x, y, a, b where x, a, b are inputs and y is the output.

```
f (x, y, a, b)
{
  if (x is 1) y = a;
  else y = b;
}
```

Which one of the following digital logic blocks is the most suitable for implementing this function?

A) Full adder
B) Priority encoder
C) Multiplexer
D) Flip - Flop

Answer : C

55. Consider the following definition in c programming language

```
struct node
{
int data;
struct node * next;
}
typedef struct node NODE;
NODE *ptr;
```

Which of the following c code is used to create new node?

A) ptr=(NODE*)malloc(sizeof(NODE));
B) ptr=(NODE*)malloc(NODE);
C) ptr=(NODE*)malloc(sizeof(NODE*));
D) ptr=(NODE)malloc(sizeof(NODE));

Answer: A

56. Consider the following linked list and following linked list representation

10--->12---->15---->25---->30---->36

```
struct node {
int data;
struct node *next;
}*start = NULL;
```

what will be the value of following statement ?

start->next->next->next->data

A) 12
B) 30
C) 15
D) 25

Answer: D

57. Consider the function f defined here:

```
struct item
{
int data;
struct item * next;
};
int f (struct item *p)
{
return((p==NULL) ||((p->next==NULL)||(p->data<=p->next->data) && (p->next)));
}
```

For a given linked list p, the function f returns 1 if and only if

A) the list is empty or has exactly one element
B) the element in the list are sorted in non-decreasing order of data value
C) the element in the list are sorted in non-increasing order of data value
D) not all element in the list have the same data value

Answer: B
Explanation: The function f() works as follows
1) If linked list is empty return 1
2) Else If linked list has only one element return 1
3) Else if node->data is smaller than equal to node->next->data and same thing holds for rest of the list then return 1
4) Else return 0

58. Consider the Singly linked list having n elements. What will be the time taken to add an node at the end of linked list if Pointer is initially pointing to first node of the list.

A) O(1)
B) O(n-1)
C) O(n)
D) O(2n)

Answer: B

59. Consider the usual algorithm for determining whether a sequence of parentheses is balanced.Suppose that you run the algorithm on a sequence that contains 2 left parentheses and 3 right parentheses (in some order).The maximum number of parentheses that appear on the stack AT ANY ONE TIME during the computation?

A) 1
B) 2
C) 3
D) 4 and above

Answer: B

60. Consider the usual algorithm for determining whether a sequence of parentheses is balanced.The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes: (()(())(())) are:

A) 1
B) 2
C) 3
D) 4 and above

Answer: C

61. Consider the virtual page reference string 1, 2, 3, 2, 4, 1, 3, 2, 4, 1. On a demand paged virtual memory system running on a computer system that main memory size of 3 pages frames which are initially empty. Let LRU, FIFO and OPTIMAL denote the number of page faults under the corresponding page replacements policy. Then

A) OPTIMAL < LRU < FIFO
B) OPTIMAL < FIFO < LRU
C) OPTIMAL = LRU
D) OPTIMAL = FIFO

Answer: B

62. const member function does not allow to modify/alter value of any data member of the class.

A) False
B) True
C) None
D) Error

Answer: B

63. CONSTRUCTORS CANNOT BE INHERITED, THROUGH A DERIVED CLASS CAN CALL THE ..... CONSTRUCTOR.

A) BASE CLASS
B) DERIVED CLASS
C) VOID CLASS
D) DEFAULT CLASS

Answer:

64. Convert binary number into gray code: 100101

A) 101101
B) 001110
C) 110111
D) 111001

Answer: C

65. Convert the binary number 1100 to Gray code.

A) 0011
B) 1010
C) 1100
D) 1001

Answer: B

66. Convert the following decimal number to BCD. 469

A) 100101101000
B) 010001101001
C) 100001101001
D) 100101100100

Answer: B

67. Convert the function F(x,y,z) =∏ (1,3,7) to other canonical form

A) F(x,y,z) = ∏(0,2,4,5,6)
B) F(x,y,z) = Σ(0,2,4,5,6)
C) F(x,y,z) =∏(0,2,4,5,6,8)
D) F(x,y,z) = Σ(0,2,4,5,6,8)

Answer: A

68. Convert the Gray code 1011 to binary.

A) 1011
B) 1010
C) 0100
D) 1101

Answer: D

69. counter and gate delays are negligible. If the counter starts at 0, then it cycles through the following sequence:

A) 0,3,4
B) 0,3,4,5
C) 0,1,2,3,4
D) 0,1,2,3,4,5

Answer: C

70. CPU fetches the instruction from memory according to the value of

A) Program counter
B) Status register
C) Instruction register
D) Program status word

Answer: A

71. Customer(customer_id,ono,dop) Here the customer_id is _____ and customer is a _

A) Relations, Attribute
B) Attributes, Relation
C) Tuple, Relation
D) Tuple, Attributes

Answer:

72. Data Integrity means
A) Providing first access to stored data
B) Providing data sharing
C) Providing access to modify structure of the database
D) Ensuring correctness and consistency of data
Answer: D

73. Data Manipulation Language enables users to
A) Retrieval of information stored in database
B) Insertion of new information into the database
C) Deletion of information from the database
D) All of the above
Answer: D

74. Database management systems are intended to
A) Eliminate data redundancy
B) Establish relationship among records in different files
C) Maintain data integrity
D) all of the these
Answer: D

75. Deadlocks are possible only when one of the transactions wants to obtain a(n) ____ lock on a data item.
A) Binary
B) Exclusive
C) Shared
D) Complete
Answer: B

76. Decoder is a
A) combinational circuit
B) sequential circuit
C) complex circuit
D) Gate
Answer: A
Explanation: Combinational circuit in which output depends only on the state of inputs.

77. Decoders and Encoders are doing reverse operation
A) True
B) False
C) Inverters
D) Inverters and AND gates
Answer: A
Explanation: Encoders encode the data to a binary number and decoders decode the original data from binary codes.

78. Deletion of a node in linked list involves keeping track of address of node which comes immediately
A) After the node that is to be deleted
B) Before the node that is to be deleted
C) After the middle node
D) None of the above

Answer: A

79. DESTRUCTOR HAS THE SAME NAME AS THE CONSTRUCTOR AND ITS PRECEDED BY

A) !
B) ?
C) ~
D) $

Answer: C
Explanation: Destructor has a same name as the constructor and it is preceded by ~.

80. Determine output:

```
void main()
{
    int c = - -2;
    printf("c=%d", c);
}
```

A) 1
B) -2
C) 2
D) Error

Answer: C

81. Determine the output frequency for a frequency division circuit that contains 12 flip-flops with an input clock frequency of 20.48 MHz.

A) 10.24 kHz
B) 5 kHz
C) 30.24 kHz
D) 15 kHz

Answer: D

82. Difficulty of performing operations and joins due to __ value

A) Null
B) Key
C) Single
D) Multi

Answer:

83. Digital electronics is based on the _____ numbering system.

A) Decimal
B) Octal
C) Binary
D) Hexadecimal

Answer: C

84. Disadvantages of File systems to store data is:

A) Data redundancy and inconsistency
B) Difficulty in accessing data
C) Data isolation
D) All of the above

Answer: D

85. Discrete quantities of information are represented in digital system with

A) Uni code
B) ASCII code
C) Binary code
D) Octal code

Answer: B

86. Dividing a program into functions

A) is the key to object oriented programming
B) makes the program easier to conceptualize
C) makes the program run faster
D) None

Answer: B

87. DTMF stands for _____

A) Dual Tone Magnetic Frequency
B) Double Tone Magnetic Frequency
C) Dual Tone Multiple Frequency
D) Dual Tone Mechanical Frequency

Answer: C

88. During the _____ design phase of database design, the properties of data are given importance, rather than its storage details.

A) Conceptual
B) Logical
C) Physical
D) Actual

Answer:

89. Dynamic loading is :

A) loading multiple routines dynamically
B) loading a routine only when it is called
C) loading multiple routines randomly
D) None of these

Answer: B

90. Each gate has a delay of

A) 1
B) 2
C) 3
D) 4

Answer:

91. Each node in singly linked list has _____ fields.

A) 2
B) 3
C) 1
D) 4

Answer: A

92. Earlier, reflected binary codes were applied to

A) Binary Addition
B) 2's Complement
C) Mathematical Puzzles
D) Binary Multiplication

Answer: C

Explanation: The reflected binary code is also known as gray code because one digit reflected to the next bit. In Gray Code, every sequence of successive bits differs by 1 bit only. Reflected binary codes were applied to mathematical puzzles before they became known to engineers.

93. Edge-triggered flip-flops must have:

A) very fast response times
B) at least two inputs to handle rising and falling edges
C) positive edge-detection circuits
D) negative edge-detection circuits

Answer: C

94. Effective access time is directly proportional to

A) Page - fault rate
B) Hit ratio
C) Memory access time
D) None of the mentioned

Answer: A

95. Eight minterms will be used for

A) Three variables
B) Four variables
C) Five variables
D) Six variables

Answer: A

96. Electric digital systems uses signals that have 2 distinct values and circuit elements having

A) One stable state
B) Two stable states
C) Three stable states
D) Four stable states

Answer: B

97. Empdt1(empcode, name, street, city, state,pincode).For any pincode, there is only one city and state. Also, for given street, city and state, there is just one pincode. In normalization terms, empdt1 is a relation in

A) 1NF Only
B) NF and hence also in 1NF
C) 3NF and hence also in 2NF and 1NF
D) BCNF and hence also in 3NF, 2NF and 1NF

Answer: B

Explanation: The relation in second normal form is also in first normal form and no partial dependencies on any column in primary key.