(Computer Science & Engineering)

1. The number of equivalence relations of the set { 1, 2, 3, 4} is _____
   a) 1   b) 16   c) 12   d) none of these

2. Cordiality of the set in {a, b, c} , {a, • , d}, { • , { • }, { • { • } } }
   a) One   b) Twoc) Three   d)Four

3. The following production A -> ab
   $$A \to aA$$
   $$aAb \to aBcb \text{ is } _____$$
   a) Type 3 grammer   b) type 2 grammer   c) type 1 grammer   d) type 0 grammer

4. A circumstance is referred to as tautology when the propostion is _____
   a) True   b) false   c) both true and false   d) neither true nor false

5. How many substrings of different lengths can be formed form a character string of length n?
   a) n   b) n^2 c) 2•   d) $n(n+1)/2$

6. If A = {a,b} the A• is _____
   a) { a, b} U { { a,b}}   b) { a,b,a,b}   c) {{ a,b } U { a,b }} d) None of these

7. Which of the following operations requires maximum memory accesses?
   a) register to register add   b) branch   c) Condition code test   d) all are same

8. The main advantage of the interrupt scheme is to avoid _____.
   a) Spooling b)Pooling   c) job scheduling   d) blocking of currently running process

9. Minimum hamming distance methods are used for correction of _____.
   a) Syntactic errors   b) semantic errors   c) algorithm errors   d) Transcription errors

10. A computer system stores floating point numbers with a 16 bit mantissa and 8 bit exponent, each in the compliment. The smallest and largest positive values that can be stored are _____
    a)1×10^{-128} and $2^{15} \times 10^{-128}$ b) 1×10^{-256} and $2^{-15} \times 10^{-255}$

    c)1×10^{-128} and $2^{-15} \times 10^{-255}$ d) 1×10^{-128} and $(2^{-15} - 1) \times 10^{-127}$

11. For a pipelined CPU with a single ALU consider the following situations.
    i)The $(j+1)^{th}$ instruction users the result of the jth instruction
    ii)The execution of a conditional jump

iii) The jth and $(j+1)^{th}$ instruction require the ALU the same time

Which of the above is a hazard?

    a) i and ii only   b) ii and iii only   c) iii only   d) All of the these

12. In a system with 32 bit virtual addresses and 1KB page size, use of one level paging tables for virtual to physical address translation is not practical because of _____.
    a) The large amount of internal fragmentation
    b) The large amount of external fragmentation
    c) The large memory overhead in maintain page tables
    d) The large computation overhead in the translation process

13. Which of the following sorting algorithm has the lowest worst case complexity?
    a) Merge sort   b) Bubble sort   c) Quick sort   d) Selection sort

14. Consider the following C code:
```
Int j,n;
J=1;
While (j<=n)
J=j*2;
```

The number of comparisons made in the execution of the loop for any n>0 is _____

    a) $[\log_2 n] - 1$ b) n   c) $[\log_2 n]$ d) $[\log_2 n] + 1$

15. The maximum number of nodes in a binary tree of height h is _____
    a) 2^h b) $2^{h-1} - 1$ c) $2^{h+1} - 1$ d) 2^{h-1}

16. Merge sort uses_____.
    a) Divide and conquer methodology   b) Backtracking approach
    b) Heuristic approach   d) Greedy approach

17. How many comparisons are required to sort an array of length 5, if a straight selection is used and the array is already sorted in the opposite order?
    a) 0   b)1   c)10   d)20

18. The main disadvantage of recession when compared to iteration is _____
    a) It needs more memory   b) It needs more execution time   c) Both   d) Neither

19. Thrashing occurs when_____
    a) Too much time is spent in the swap between memory & disk
    b) Too many processors try to access the same resource
    c) The size of the data to be inserted is less than the size of the page
    d) None of the above

20. The search concept used in associative memory is
    a) Sequential search   b) Parallel search   c) Binary search   d) Selection search

21. The solution for external fragmentation is _____
    a) Compaction   b) Segmentation   c) both a and b   d) neither a nor b

22. Which of the following does Not lead to deadlock any time
    a) Mutual exclusion   b) Partial assignment of resource
    c) Non preemption   d) Process suspension

23. Semantic errors can be corrected at _____
    a) Compile time only   b) Run time only   c) Both compile & runtime
    d) None of the above

24. The basic concept behind cache memory is
    a) FIFO   b) Locality of reference   c) Easier accessing of cache as compared to main
    memory   d) none of these

25. A relational database in 3 NF may still have undesirable data redundancy because there may
    exist_____
    a) Transitive functional dependencies
    b) Non-trivial functional dependencies involving prime attributes only on the right side
    c) Non-trivial functional dependencies involving prime attributes only on the side left
    d) None of these

26. Consider the relation r_1 (P, Q, R) and r_2 (R, S, T) with the Primary Key P and R respectively. The
    relation r_1 contains 2000 tuples and r_2 contains 2500 tuples. The maximum size of the join r_1 ⋈ r_2
    is _____
    a) 2000   b) 2500   c) 4500   d) 5000

27. Consider the Schema R= (S, T, U, V) and the dependencies S→T, T→U, U→V and V→S
    Let R = (R_1 and R_2) be the decomposition such that R_1 ⋂ R_2 = •. The decomposition is

    _____
    a) Not in 2NF   b) in 2NF but not in 3NF   c) in both 2NFand 3NF   d) can't decide

28. The following instance of a relation R(A, B, C) is given.

A	B	C
1	1	1
1	1	0
2	3	2
2	3	2

From this we can conclude that _____

    a) A functionally determines B and B functionally determines C
    b) A functionally determines B and B does not functionally determines C
    c) B does not functionally determines C
    d) A does not functionally determines B and B does not functionally determines C

29. Which of the following statement is FALSE?
    a) Any relation with two attributes is in BCNF
    b) A relation in which every key has only one attribute is in 2NF
    c) A prime attribute can be transitively dependent on a key in a 3NF relation
    d) A prime attribute can be transitively dependent on a key in a BCNF relation

30. Which normal form is considered adequate for normal relational data base design?
    a) 2NF   b) 3NF   c) 4NF   d) 5NF

31. The concept of representing only the essential features of a class without the background details is called_____
    a) Abstraction   b) Encapsulation   c) Dynamic binding d) Neither

32. When properties of one class are inherited by more than one classes, it is called_____
    a) Multiple Inheritance b) Dividend inheritance   c) Hierarchical inheritance   d) none of them

33. Operator overloading is also called_____
    a) Abstraction   b) Compile time polymorphism
       c) Basic inheritance   d) nether

34. Which of the following statement is true in C++?
    a) By default, members of a class are private
    b) By default, members of a structure are public
    c) Neither a nor b
    d) Both a and b

35. A member declared as protected is accessible only to member function _____
    a) Within the class   b) Within the class and in classes immediately derived from it
    c) To all friends   d) Nobody except the defining function

36. A function which is inside a base class, but performs no operation there is also termed a _____.
   a) Dummy function   b) Void function   c) Virtual function
    d) Pure virtual function

37. A B tree has 4 levels including the root node. If a new key is inserted in this index, then the maximum number of nodes that could be newly created by the action is ___
    a) 5   b)4   c)3   d)2

38. A greedy method provides the most optimal solution, if one exists.
    a) Sometimes   b) Always   c) Provides only a local optimum

39. Kruskal's algorithm for finding the minimum cost spanning tree is based on _____
    a) Greedy method   b) Divide and conquer   c) Dynamic programming
    d) None of the above

40. What is the chromatic no. of the following graph?
    a) 2   b) 3   c) 4   d) 5
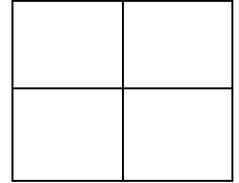
41. An algorithm is bounded on the lower side by 2^n. The required for its execution is
    _____.
    a) Linear   b) Binary   c) Polynomial   d) Exponential

42. In a software project, COCOMO used to estimate_____
    a) Effort and duration based on the size of the software
    b) Size and duration based on the effort on the software
    c) Effort and cost based on the duration of software
    d) Size, effort and duration based on the cost of software

43. A software configuration management tool helps in _____
    a) Keeping track of schedule based on the milestones reached
    b) Maintaining different versions of the configurable items
    c) Managing manpower distribution by changing the configurable items
    d) All the above

44. The diagram that helps in understanding and representing user requirements for a software project using
    UML is _____.
    a) E-R diagram   b) Deployment diagram   c) Data flow diagram
    d) Use-case diagram

45. In the spiral model of software development, the primary determinant in selecting activities in each
    interaction is _____
    a) Interaction size   b) Cost   c) Adopted process such Rational Unified Process
   d) Risk

46. Which of the following is NOT considered when computing function points for a software project?
    a) External inputs and outputs   b) Programming language   c) User interactions
    d) No. of programmers

47. An external entity in DFD is represented by _____
    a) A circle   b) A rectangle   c) Diamond   d) None of these

48. Data flow diagrams are usually developed during _____.

a) System analysis phase   b) System design phase

c) Implementation phase   d) Testing phase

49. Consider the entitles 'hotel room' and 'person' with many to many relationship 'lodging' as below.
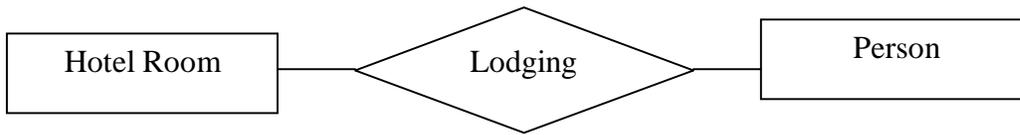
If we wish to store information about the rent payment ot be made by person(s) occupying different hotel rooms then this information should appear as an attribute of _____.

a) Person   b) Hotel room   c) Lodging   d) None of these

50. Which of the following is true for a DML?

a) It cannot interface with HLL

b) It is used to define physical characteristics of each record

c) It is essentially the link between logical and physical views of a database

d) None of these