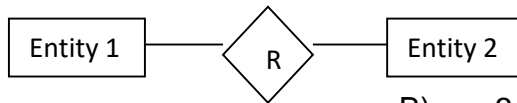


(Post Name: Technical Assistant , Subject/Field: CS & IT , Date of Exam: 27-04-2023 ,
Time of Exam: 12:30 PM)

1. If the relational table is satisfying the Transitive Dependencies only then the Table is in:
A) 2NF
B) 3NF
C) BCNF
D) None of above
2. If the dependency holds true as $A \rightarrow Z$ only by $A \rightarrow B$ and $B \rightarrow Z$, then it is called
A) Join Dependency
B) Transitive Dependency
C) Trivial Dependency
D) Multi-valued Dependency
3. When any ER model is decomposed into a Relational Table, then the relations that bring down will usually be in
A) 1NF
B) 2NF
C) 3NF
D) BCNF
4. How many Tables are mostly formed when the given ER diagram is converted into relational tables:



- A) 2
B) 3
C) 1
D) 4
5. When the data is hided in an ER model, it is known as:
A) Abstraction
B) Inheritance
C) Generalization
D) Specialization
6. Suppose on an item A, two transactions T1 and T2 requests for the shared lock, such that Timestamp of T1 is earlier than Timestamp of T2. This can resulted into the condition of:
A) Deadlock
B) Immediately Granted
C) Rejected
D) Starvation
7. Using the 2's complement when the two numbers (-83) and 16 are binary added, this resulted into
A) $(-1000011)_2$
B) $(-1000010)_2$
C) $(1000011)_2$
D) $(1000010)_2$

8. The number and type of logic gate required when a NOR-based SR latch is converted to an SR flip-flop
- A) 3 AND gates with 2 input each B) 2 AND gates with 2 input each
 C) 3 OR gates with 2 input each D) 2 OR gates with 2 input each
9. Using the Two 16 x 1 mux we can generate the multiplexer of size _____
- A) 8 x 1 B) 64 x 1
 C) 32 x 1 D) 4 x 1
10. Which of the following is not a sequential code?
- A) 8421 B) 8420
 C) 4210 D) 4802
11. A priority encoder has four inputs A_0 , A_1 , A_2 , and A_3 where A_3 has the highest priority and A_0 has the least priority. If $A_2 = 0$, what will be the output?
- A) 00 B) 01
 C) 10 D) 11
12. The internal memory of the CPU consists of
- A) Set of ALU B) Set of Registers
 C) Set of Microprocessors D) RAM and ROM
13. The control unit controls other units by generating
- A) Transfer Signals B) Timing Signals
 C) Control Signals D) Command Signals
14. To reduce the memory access time the digital system uses
- A) Cache B) High Capacity RAM
 C) Virtual memory D) Heaps
15. The two successive memory initiations time delay is called
- A) Memory Access time B) Memory Search Time
 C) Memory Cycle Time D) Memory Fetch Time
16. Suppose a digital computer has 18 address signals and the 18-bit address bus. The address space of this computer is
- A) 128K B) 256K
 C) 64K D) 512K
17. In case using the stack the given expression $(A+B*(C-D)^E+(F/G)^H-I)$ is converted to postfix, then the resultant expression is:
- A) ABCD-E^*+FG/H^+I - B) ABCD-E^*+FG/H^+I -
 C) ABCD-E^*FG+/H^+I - D) ABCD-E^*FG+/H^+I -

23. Chose a correct statement for any of the Recursive algorithm base class
- A) Necessary and solved without recursion
 - B) Not necessary and solved without recursion
 - C) Necessary and solved with recursion
 - D) Does not solve it directly
24. Which of the following is a Fibonacci series?
- A) 0, 1, 1, 2, 3, 5, 8, 13
 - B) 0, 1, 1, 3, 3, 5, 8, 13
 - C) 0, 1, 1, 2, 3, 5, 9, 13
 - D) 0, 1, 1, 2, 3, 5, 8, 12
25. Consider an unsorted array of size n. Two algorithms are used to find the minimum and maximum number in an array, say A1 and A2. An algorithm A1 is using C1 comparisons without divide and conquer approach. While an algorithm A2 search linearly and uses C2 comparisons. In the worst case the correct relationship between C1 and C2 is
- A) $C1 < C2$
 - B) $C1 = C2$
 - C) $C1 > C2$
 - D) No relationship
26. Among given time complexities, which of the following is the best possible time complexity of an algorithm
- A) $O(2^n)$
 - B) $O(n^2)$
 - C) $O(\log n)$
 - D) $O(n \log n)$
27. The minimum number of the multiplications required to solve the given inequality on any given input is,
- $$P(x) = \sum_{i=0}^3 a_i x^i$$
- A) 3
 - B) 2
 - C) 4
 - D) 8
28. Suppose the Knapsack is having the capacity of 40. There are three items whose value and weight are given as (60,20), (50,25), (20,5). The maximum output when considering the item to be divisible and non-divisible is
- A) 110 and 80
 - B) 110 and 60
 - C) 100 and 80
 - D) 100 and 60
29. The correct statement to return the DataFrame when given dict of array as an input is
- A) `DataFrame.from_items`
 - B) `DataFrame.from_dict`
 - C) `DataFrame.from_record`
 - D) `DataFrame.from_list`

30. What will be the output of the python function `re.compile('India is Great', re.X)`
- A) `re.compile('India is Great', re.VERBOSE)`
 - B) `re.compile('India is Great', re.ERROR)`
 - C) `[l, n, d, i, a, i, s, g, r, e, a, t]`
 - D) Junk value
31. The function `re.subn` in python returns an
- A) String
 - B) List
 - C) Tuple
 - D) Number
32. Given a dictionary `d = {"ABC":40, "PQR":45}`. What happens when we try to retrieve a value using the expression `d["XYZ"]`?
- A) Syntax error
 - B) Run-time error
 - C) Keyerror Exception
 - D) Returns None
33. The output of the given python code is
- ```
i=0
def change(i):
 i=i+1
 return i
change(1)
print(i)
```
- A) 0
  - B) 1
  - C) 2
  - D) Exception
34. Without the Return Statement, the function in python returns
- A) Error
  - B) Null
  - C) Int
  - D) None
35. Number of states of the FSM required to store "m" words, each of length 'n' is
- A)  $2^{mn}$
  - B)  $2^{m+n}$
  - C)  $m \times 2^n$
  - D)  $n \times 2^m$
36. If two finite states machine F1 and F2 are isomorphic, then F1 can be transformed to F2 by
- A) Relabeling states
  - B) Relabeling edges
  - C) Relabeling inputs
  - D) Relabeling both states and edges

37. Which of the following pairs of regular expressions are not equivalent?
- A)  $1(01)^*$  and  $(10)^*1$                       B)  $x(xx)^*$  and  $(xx)^*x$   
 C)  $a^+$  and  $a^+a^{**}$                                       D)  $1(01^*)1^*$  and  $(10^*)11^*$
38. A Turing Machine (TM) without rewinding capability and unidirectional tape movement is considered as
- A) Finite State machine                                      B) Non-deterministic Finite State machine  
 C) Deterministic PDA                                              D) Non-deterministic PDA
39. A language L is accepted by a finite automaton if and only if it is
- A) CFG                                                              B) CSL  
 C) Recursive                                                      D) Right Linear
40. The identification of common sub-expression and replacement of run-time computations by compile-time computations is
- A) Local optimization                                      B) Global optimization  
 C) Loop optimization                                              D) Constant folding
41. The relationship in between the basic blocks and their successors is best represented by
- A) Flow Graph                                                      B) DAG  
 C) Control Graph                                                      D) Hamiltonian Graph
42. Generation of intermediate code based on an abstract machine model is useful in compilers because
- A) it makes implementation of lexical analysis and syntax analysis easier  
 B) syntax directed translations can be written for intermediate code generation  
 C) it enhances the portability of the front end of the compiler  
 D) it is not possible to generate code for real machines directly from high level language programs
43. To recover from an error, the operator precedence parser may
- A) insert symbols onto the array  
 B) delete symbol from array  
 C) insert symbol onto the stack  
 D) insert and delete symbol onto priority queue



50. SNMP protocol is implemented with a daughter board in
- A) Nodes
  - B) Server
  - C) Hubs
  - D) Networking PC
51. Maximum data rate of a channel for a noiseless 6kHz binary channel is
- A) 6000 bps
  - B) 8000 bps
  - C) 3000 bps
  - D) 12000 bps
52. The Ethernet packet is present in \_\_\_\_\_ layer of OSI model
- A) Physical
  - B) Network
  - C) Transport
  - D) Session
53. The size of the Preamble and SFD in the Ethernet frame is
- A) 7-octet and 1-octet
  - B) 7-octet and 2-octet
  - C) 2-octet and 7-octet
  - D) 1-octet and 7-octet
54. If data rate of ring is 20 Mbps, signal propagation speed is 200 m/ms, then number of bits that can be placed on the channel of 200 km is
- A) 5k bits
  - B) 2k bits
  - C) 10k bits
  - D) 20k bits
55. Using any network model architecture, the decryption and encryption of data is to be handled at
- A) Network layer
  - B) Presentation layer
  - C) Data Link Layer
  - D) Physical layer
56. Count-to-infinity problem occurs in
- A) Distance vector routing
  - B) Link state routing
  - C) Shortest Path First routing
  - D) Flooding
57. What can be measured by using the analysis of frequency of failure?
- A) Security
  - B) Reliability
  - C) Performance
  - D) Consistency
58. A protocol that is commonly used to log into a remote host is called
- A) FTP
  - B) SMTP
  - C) RARP
  - D) TELNET

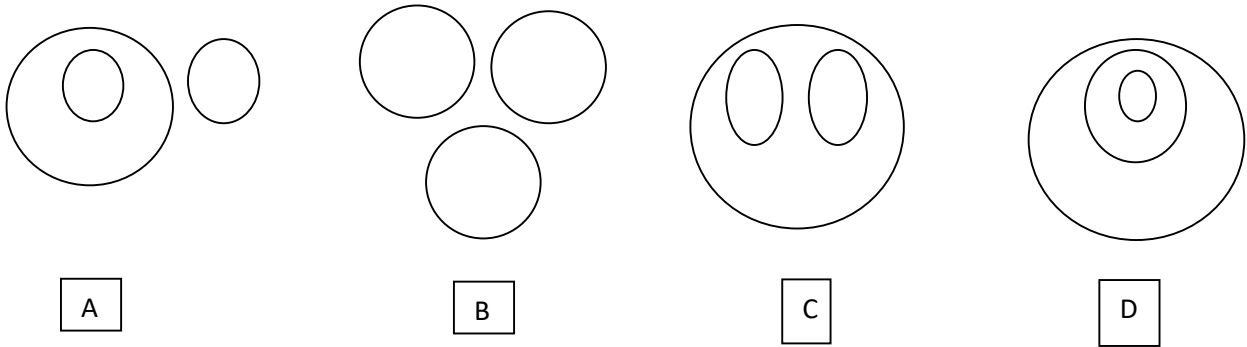




68. The maximum rate at which data can be transmitted through a channel without errors is achieved with \_\_\_\_\_
- A) Channel capacity                      B) Channel bandwidth  
C) Signal to Noise ratio                D) Frequency and Modulation
69. The last two digit of  $7^{81}$  are
- A) 07                                          B) 17  
C) 37                                          D) 47
70. The number of incongruent integers satisfying the congruence  $18x \equiv 30 \pmod{42}$  is
- A) 5                                            B) 6  
C) 7                                            D) 8
71. Expression of the integer 6 as a linear combination of 12378 and 3054 is
- A)  $12378 \times 130 - 3054 \times 535$   
B)  $12378 \times 132 - 3054 \times 535$   
C)  $12378 \times 132 - 3054 \times 532$   
D)  $12378 \times 132 - 3054 \times 530$
72. The value of the Legendre symbols  $\frac{19}{23}$  is
- A) 1  
B) 0  
C) -1  
D) Does not exist
73. For the universal set  $U$  of first five even numbers, the complement of set  $A = \{2,4\}$  is
- A)  $\{6,8\}$                                       B)  $\{8,10\}$   
C)  $\{6,8,10\}$                                 D)  $\{6,10\}$
74. Which of the following is a subspace of the vector space  $R^3$ ?
- A)  $\{(x, y, z): x + y = 0\}$                 B)  $\{(x, y, z): x - y = 2\}$   
C)  $\{(x, y, z): x + y = 1\}$                 D)  $\{(x, y, z): x - y = 1\}$



81. Which of the following diagram represents the given group of words:



Sentence, Word, Letter

- |    |   |    |   |
|----|---|----|---|
| A. | B | B. | A |
| C. | D | D. | C |

82. In the following question, one number is wrong in the series. Find out the wrong number.

701, 348, 173, 85, 41, 19, 8

- |    |     |    |     |
|----|-----|----|-----|
| A. | 173 | B. | 41  |
| C. | 19  | D. | 348 |

83. In the following question, given interchanges are made in signs and numbers, which one of the four equations would be correct?

Given interchanges: Signs  $\times$  and  $\div$ ; numbers 4 and 9

- |    |                             |    |                             |
|----|-----------------------------|----|-----------------------------|
| A. | $94 \times 7 \div 47 = 329$ | B. | $94 \times 7 \div 97 = 324$ |
| C. | $49 \times 7 \div 49 = 7$   | D. | $47 \times 9 \div 94 = 18$  |

84. The following question consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

- I) All the trees in the park are flowering trees.
- II) Some of the trees in the park are dogwoods.
- III) All dogwoods in the park are flowering trees.

If the first two statements are true, the third statement is

- |    |           |    |                   |
|----|-----------|----|-------------------|
| A. | True      | B. | False             |
| C. | Uncertain | D. | None of the above |

85 The question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments IS a 'strong' argument and which IS a 'weak' argument:

Statement: Should India make efforts to harness solar energy to fulfil its energy requirements?

Arguments:

- I - Yes, most of the energy sources used at present is exhaustible.
- II - No. Harnessing solar energy requires a lot of capital, which India lacks in.

- A. Only argument I is strong
- B. Only argument II is strong
- C. Either I or II is strong
- D. Neither I nor II is strong

86 Read the below passage carefully and answer the question:

At a small company, parking spaces are reserved for the top executives: CEO, president, vice president, secretary, and treasurer with the spaces lined up in that order. The parking lot guard can tell at a glance if the cars are parked correctly by looking at the colour of the cars. The cars are yellow, green, purple, red, and blue, and the executives' names are Alice, Bert, Cheryl, David, and Enid.

- The car in the first space is red.
- A blue car is parked between the red car and the green car.
- The car in the last space is purple.
- The secretary drives a yellow car.
- Alice's car is parked next to David's.
- Enid drives a green car.
- Bert's car is parked between Cheryl's and Enid's.
- David's car is parked in the last space.

What colour is the vice president's car?

- A. Green
- B. Yellow
- C. Blue
- D. Purple

87 Read the information given below and on the basis of the information, answer the question

There are five persons P, Q, R, S, and T. One is football player, one is chess player, one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

Who is the chess player?

- A. Q
- B. R
- C. S
- D. T









