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POLYTECHNIC TRB
COMPUTER SCIENCE



Data Structures

Algorithms

Operating Systems

Computer Networks

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Module Name : Computer Science Engineering-E

PART-A

1. In a Boolean Algebra, the value of the expressions x + xy = ___ and x(x + y) =

A) $x, \bar{y}$

B) $\bar{x}, y$

C) $y, \bar{y}$

D) x, x — **(Correct Answer)**

2. The Negation of the statement "All students in this section are clever".

A) There exists a student in this section, is not clever - **(Correct Answer)**

B) There exists a student in this section, is clever

C) All students in this section are not clever

D) No student in this section is clever

3. The co-efficient of x^k in the expansion of $\left(x+\frac{1}{x}\right)^{100}$, where *K* is an integer, is :

A) ${}^{100}C_{\frac{100-K}{2}}$ for $-100 \leq K \leq 100, K \equiv 1(\text{mod}2)$

B) ${}^{100}C_{\frac{100-K}{2}}$ for $-100 \leq K \leq 100, K \equiv 0(\text{mod}2)$ - **(Correct Answer)**

C) ${}^{100}C_{\frac{100-K}{2}}$ for $0 \leq K \leq 100, K \equiv 1(\text{mod}2)$

D) ${}^{100}C_{\frac{100-K}{2}}$ for $0 \leq K \leq 100, K \equiv 0(\text{mod}2)$

4. In a gambling game, a man is paid $5, if he gets all heads or all tails when three coins are tossed and he will pay out $3 if either one or two heads show. Then his expected value is :

A) $\frac{7}{2}$

B) -1 - **(Correct Answer)**

C) 1

D) $-\frac{7}{2}$

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5. If $A = \begin{bmatrix} 2 & -1 \\ 2 & -1 \end{bmatrix}; B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A+B)^2 = A^2 + B^2$ then $a =$ ___ .

A) 4, 1

B) 1, 4

C) 1, 3

D) 3, 4

Correct Answer:- *

6. Let s be a set with 100 elements. Then the number of proper subsets of s with even number of elements, is :

A) $2^{99} - 2 -$ (Correct Alternative)

B) 2^{50}_2

C) $2^{99} - 1$

D) $2^{50} - 1$

7. The system of equations

$-2x + y + z = a$

$x - 2y + z = b$

$x + y - 2z = c$

will have non-trivial solutions, if ___ .

A) $-a + b + c = 0$

B) $a - b + c = 0$

C) $a + b + c = 0$ - **(Correct Answer)**

D) $a + b - c = 0$

8. Let $G = \left\{ \begin{bmatrix} a & a \\ a & a \end{bmatrix} / a \neq 0 \in R \right\}$ be a group of singular matrices under matrix multiplication. Then formula for inverse is :

A) [1/a 1/2a
1/3a 1/4a]

B) [1/2a 1/2a
1/2a 1/2a]

C) [1/4a 1/4a
1/4a 1/4a] — **(Correct Answer)**

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D) [a 2a
3a 4a]

9. The set of Real Numbers is ___ .

A) finite

B) infinite

C) countable

D) uncountable - **(Correct Answer)**

10. Let $(L_1\ ^* \oplus)$ be a distributive lattice, for any a, b, c $\in L_1$ b = c only if :
***A*: $a * b = a * c$**

B) $a^*b = a^*c, a \oplus b = a \oplus c$ - **(Correct Answer)**

C) $a^*b = a \oplus c, a \oplus b = a^*c$

D) $a \oplus b = a \oplus c$

11. . Which memory is used to increase the speed of processing by making current programs and data available to the CPU at the rapid rate ?

A) Main memory

B) Cache memory - **(Correct Answer)**

C) Magnetic tape

D) Floppy disk

12. Which memory is used for implementing main memory ?

A) Dynamic RAM - **(Correct Answer)**

B) Static RAM

C) ROM

D) Cache memory

13. The average time required to reach a storage location in memory and obtain its contents is called ___ .

A) access time - **(Correct Answer)**

B) seek time

C) transfer time

D) average time

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14. Which signal CPU activates to inform the external DMA that the buses are in high impedance state ?

A) bus request

B) bus grant - **(Correct Answer)**

C) burst transfer

D) interrupt signal

15. Name the concept used in large computer system that permit the user to construct programs as though large memory space were available, equal to auxillary memory.

A) Cache memory

B) Main memory

C) Dynamic random access memory

D) Virtual memory - **(Correct Answer)**

16. Which printer uses a rotating photographic drum that is used to imprint the character images ?

A) Lazer printer - **(Correct Answer)**

B) Dot matrix printer

C) Drum printer

D) Dairy wheel printer

17. Which mode of transfer method is used in low speed computer ?

A) Priority interrupt

B) Programmed I/O - **(Correct Answer)**

C) Direct memory access

D) Polling method

18. In which memory, the data can be stored as change on capacitors ?

A) SRAM

B) DRAM - **(Correct Answer)**

C) EPROM

D) ROM

19. Which technique can minimize the penalty incurred as a result of conditional branch instruction ?

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A) delayed branching - **(Correct Answer)**

B) branch prediction

C) prefetching

D) static branch prediction

20. When two or more instructions that are already in the pipeline need the same resource :

A) structural hazard - **(Correct Answer)**

B) data hazard

C) control hazard

D) delayed branch

21. Given an array A[1: n] of integers, the worst - case running time to compute the maximum element is :

A) $0(n^2)$

B) 0 (n) - **(Correct Answer)**

C) 0 (log n)

D) 0 (1)

22. Which one of the following statements is false ?

A) Eulerian circuit is a problem in P.

B) If some NP complete problem belongs to P, then P ≠ NP. - **(Correct Answer)**

C) A problem is NP complete if it belongs to NP and is NP - Hard.

D) No polynomial time algorithm is known for any of the many NP - complete problems.

23. A good data structure to use when there are unknown number of items to store is :

A) array

B) linked list - **(Correct Answer)**

C) stacks implemented as arrays

D) queues implemented as arrays

24. An array based stack implementation where N is the size of the array and n is the number of elements in the stack, has a space complexity of :

A) 0 (N + n)

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B) 0 (N• n)

C) 0 (N) - **(Correct Answer)**

D) 0 (n)

25. With regard to P/NP class of problems, find the odd man out in the list :

A) 2 - Colourability

B) Eulerian circuit

C) Planarity

D) Hamiltonian cycle - **(Correct Answer)**

26. The time complexity of undertaking insertion, deletion and look-up of a key, in a reasonably balanced binary search tree is :

A) 0(log n),0(log n),0(log n) - **(Correct Answer)**

B) 0 (n), 0 (log n), 0 (n)

C) 0 (log n), 0 (n), 0 (n)

D) 0 (n), 0(n), 0(n)

27. Which of these is false with regard to adjacency matrix of a simple graph ?

A) An adjacency matrix has entries 0 or 1.

B) The diagonal elements of an adjacency matrix are zeroes.

C) The degree of a vertex v is the sum of the entries in the row for v.

D) Every adjacency matrix is a non - symmetric matrix. - **(Correct Answer)**

28. Which of these is not a characteristic of red-black trees ?

A) paths from the root to any leaf have the same number of black nodes

B) children of a red node are always black

C) root node is always red - **(Correct Answer)**

D) it is a binary search tree

29. To find the node with the smallest value (MIN) in a binary search tree.

A) Traverse right, terminating when a node with no right subtree is found that node is MIN.

B) Simply access the root node. That node is MIN.

C) Keep traversing left terminating when a node with no left subtree is found. That node is MIN. - **(Correct Answer)**

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D) Undertake a post-order traversal of the binary search tree. The last node is MIN.

30. In graph colouring where labels are colours, a k -colouring is proper if :

A) adjacent vertices have different labels - **(Correct Answer)**

B) adjacent vertices have same labels

C) all odd degree vertices have different labels

D) all even degree vertices have different labels

31. The use of the cache is :

A) to set a flag

B) to execute a sequence

C) to provide temporary residence for instructions - **(Correct Answer)**

D) to enhance throughput

32. The output from a compiler may be :

A) object code file

B) system file

C) machine readable file - **(Correct Answer)**

D) application file

33. What is an inode in unix :

A) user instruction

B) physical mapping

C) file information - **(Correct Answer)**

D) IO directory

34. Give the name of the table that indicates which blocks on secondary storage are free and available for allocation to files :

A) File allocation table

B) Data allocation table

C) Index table

D) Disk allocation table - **(Correct Answer)**

35. Identify which is not a consumable resource :

A) interrupts

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B) signals

C) messages

D) I/O - **(Correct Answer)**

36. What happens if the time allocated in a round-robin scheduling is very large ?

A) Overhead occurs

B) Results in FCFS scheduling - **(Correct Answer)**

C) Goes to blocked state

D) Terminate scheduling

37. Paging suffers from ___ and segmentation suffers from ___ .

A) External fragmentation, Internal fragmentation

B) Internal fragmentation, External fragmentation - **(Correct Answer)**

C) dynamic linking, dynamic loading

D) fixed partitioning, dynamic partioning

38. Assume a page reference string for a process with 'm' frames (initially all empty). The page reference string has length 'p' with 'n' distinct page number occuring in it. For any page-replacement algorithms, what is a lower bound and an upper bound on the number of page faults ?

A) n/2, p

B) p, n - **(Correct Answer)**

C) n, p/2

D) n, p

39. The integrity of a file system is checked out by using ___ instruction.

A) cshrc

B) syplog

C) fsck - **(Correct Answer)**

D) termcap

40. The operations performed on a semaphore are :

A) Initialize

B) Decrement

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C) Increment

D) Initialize, Decrement, Increment - **(Correct Answer)**

41. Which one of the following transaction property ensures the persistence of data ?

A) Atomicity

B) Isolation

C) Durability - **(Correct Answer)**

D) Consistency

42. The SQL command used to delete the structure and contents of a table is :

A) Drop - **(Correct Answer)**

B) Delete

C) Remove

D) Truncate

43. The E-R feature which allows relationships among relationships is calleD)

A) Generalization - **(Correct Answer)**

B) Abstraction

C) Specialization

D) Aggregation

44. Which of the following statement is not true about view serializability?

A) Every view serializable schedule is also conflict serializable - **(Correct Answer)**

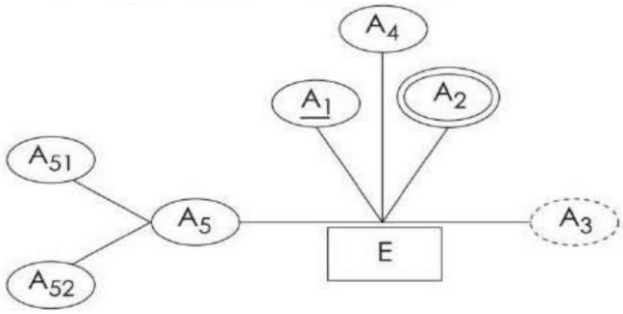
B) View serializable schedule is view equivalent to a serial schedule

C) Every conflict serializable schedule is also view serializable

D) View serializable schedule may contain blind writes

45. Consider the following E-R model :

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which of the following statement is false ?

A) Attribute A_3 is derived attribute

B) Attribute A_5 is multivalued attribute - **(Correct Answer)**

C) Attribute A_1 is primary key

D) Attribute A_2 is multivalued attribute

46. Given the relational algebra expression $E_1 \bowtie\theta (E_2 - E_3)$. Identify the equivalent relational algebra expression.

A) $E_1 - E_2 \bowtie\theta E_1 - E_3$

B) $E_1 \bowtie\theta E_2 - E_1 \bowtie\theta E_3$ — **(Correct Answer)**

C) $(E_1 \bowtie\theta E_2) - E_3$

D) $(E_1 \bowtie\theta E_2)$

47. Which command is used to change the column's definition in a table?

A) Drop table

B) Modify table

C) Alter table - **(Correct Answer)**

D) Create table

48. Which is the valid data type in SQL ?

A) Number

B) Integer

C) Varchar

D) Number, Integer, and Varchar - **(Correct Answer)**

49. For a select query, Select * from loan where amount > 2000 and branch = 'TPK' the equivalent relational algebra expression is :

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A) $\sigma_{(}$amount > 2000 ∨ branch = 'TPK'$_{)}$ (loan)

B) $\pi_{(}$amount, branch$_{)}$ ($\sigma_{(}$amount > 20000 ∧ branch = 'TPK'$_{)}$ (loan))

C) $\sigma_{(}$amount > 2000 ∧ branch = 'TPK'$_{)}$ (loan) — **(Correct Answer)**

D) $\sigma_{(}$amt > 200 ∨ branch = 'TPK'$_{)}$ (loan)

50.. The non-leaf nodes of a B^+Tree has (with fixed value of n) :

A) $\lceil(n-1)/2\rceil$ to n children

B) $\lceil n/2\rceil$ to n children - **(Correct Answer)**

C) $\lceil n/2\rceil$ to $n-1$ children

D) $\lceil(n-1)/2\rceil$ to $n-1$ children

51. . The character class for the set of characters that can appear at the end of a legitimate English Sentence (eg : exclamation point) will be :

A) [? . !]

B) [. ! ?]

C) [. ? !] - **(Correct Answer)**

D) [. ? ?]

52. In a Parse or derivation tree the root node is always represented as :

A) Start Symbol - **(Correct Answer)**

B) Terminal

C) Non-Terminal

D) Terminal or Non-Terminal

53. The following grammar G is

S → SA | A
A → a

A) LL(1)

B) SLR(1)

C) SLR(1) but not LL(1) — **(Correct Answer)**

D) Not SLR(1)

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54. In a Syntax Directed Definition (SDD), an inherited attribute at Node N is defined only in terms of attributes value at ___ .

A) N's Siblings

B) The Node N itself

C) N's Parent

D) N's Parent, N itself and N's Siblings — **(Correct Answer)**

55. The three address code (3Ac) for the expression a = b[i] + c[j] is given as :

A)

OP arg1 arg2 Result

(0) =[] b i t_1

(1) =[] c j t_2

(2) + t_1 t_2 t_3

(3) = t_3 a

— **(Correct Answer)**

B)

OP arg1 arg2 Result

(0) =[] c j t_2

(1) =[] b i t_1

(2) + t_1 t_2 t_3

(3) = t_3 a

C)

OP arg1 arg2 Result

(0) =[] b i t_1

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OP arg1 arg2 Result

(1) =[] c j t_2

(2) + t_3 t_1 t_2

(3) = a t_3

D)

OP arg1 arg2 Result

(0) =[] i b t_1

(1) =[] j c t_2

(2) + t_1 t_3 t_2

(3) = t_3 a

56. The C function f is defined by : int f(int x, *Py, **PPz){ **PPz +=1; *Py+=2; x+= 3; return x + y + z; Variable a is a pointer to b; variable b is a pointer to c and c is an integer currently with value 4. If we call f(c, b, a), what is returned ?

A) 21

B) 20

C) 18 - **(Correct Answer)**

D) 22

57. The output of syntax Analysis phase of the compiler is :

A) Tokens

B) Intermediate code

C) Syntax tree - **(Correct Answer)**

D) Abstract Syntax tree

58. The following grammar is S → Aa|bAc|Bc/bBa A→g B → g

A) not LR(1)

B) not LALR(1)

C) LALR(1)

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D) LR(1) but not LALR(1) - **(Correct Answer)**

59. Consider the grammar

S′ → S
S → aAd | bBd | aBe | bAe
A → c
B → c

For the set of items
{[A → c●, d], [B → c●, e]}, the valid viable prefix is

A) ac — **(Correct Answer)**

B) bc

C) ca

D) cb

60. For the set of items {[$A \rightarrow c \cdot, d$], [$B \rightarrow c \cdot, e$]}, the valid viable prefix is B: bc

Two states p and q of a deterministic finite state automata (dfa) are called indistinguishable if :

A) δ*(p, ω) ∈ F implies δ*(q, ω) ∈ F and
δ*(p, ω) ∉ F implies δ*(q, ω) ∉ F for all ω ∈ Σ* — **(Correct Answer)**

B) δ*(p, ω) ∉ F implies δ*(q, ω) ∈ F and
δ*(p, ω) ∉ F implies δ*(q, ω) ∉ F for some ω ∈ Σ*

C) δ*(p, ω) ∈ F implies δ*(q, ω) ∉ F and
δ*(p, ω) ∉ F implies δ*(q, ω) ∈ F for all ω ∈ Σ*

D) δ*(p, ω) ∈ F implies δ*(q, ω) ∈ F and
δ*(p, ω) ∉ F implies δ*(q, ω) ∉ F for some ω ∈ Σ*

61. Mail services and delivery services are available to network users through the ___ layer.

A) Data link

B) Session

C) Transport

D) Application - **(Correct Answer)**

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62. In Ethernet, the source address field in the MAC frame is ___ address.

A) The original sender's physical

B) The previous station's physical - **(Correct Answer)**

C) The next destination's physical

D) The original sender's service port

63. Token ring allows each station to send ___ frame per turn.

A) One - **(Correct Answer)**

B) Two

C) Three

D) Zero

64. In ___ ARQ, if a NAK is received, only the specific damaged or lost frame is retransmitted.

A) Stop-and-wait

B) Go-back-n

C) Selective-reject - **(Correct Answer)**

D) CRC

65. In distance vector routing, each router receives vectors from ___ .

A) Every router in the network

B) Every router less than two units away

C) A table stored by the software

D) Its neighbors only - **(Correct Answer)**

66. What are the ranges for the port numbers in TCP/IP protocol suite ?

A) 65,536

B) 0 to 65536

C) 0 to 65,535 - **(Correct Answer)**

D) 1 to 65535

67. When all fragments of a message have not been received within the designated amount of time, which error message will send by ICMP ?

A) Source - quench

B) Time - exceeded - **(Correct Answer)**

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C) Parameter - problem

D) Timestamp - request

68. During an FTP session, the data connection is opened ___ .

A) Exactly once - **(Correct Answer)**

B) Exactly twice

C) As many times as necessary

D) Exactly thrice

69. Which of the following networking device forwards every packet and has no filtering capability ?

A) Bridge

B) Repeater - **(Correct Answer)**

C) Router

D) Brouter

70. Which of the following incorporates all communication in a home or building into a single interface ?

A) HDLC

B) ISDN - **(Correct Answer)**

C) BRI

D) IDN

71. Bresenham line drawing algorithm scan converts lines using :

A) incremental integer calculations - **(Correct Answer)**

B) non-linear calculations

C) multiplicative calculations

D) incremental decimal calculations

72. A scaling transformation alters the size of an object. Scaling can be performed for polygons by multiplying the coordinate values (x, y) of each vertex by scaling factors s_x and s_y to produce the transformed coordinates (x^1, y^1).

$x^1 = x.s_x y^1 = y.s_y$

Specifying a value of 1 for both s_x and s_y will :

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A) reduce the size of the object

B) enlarge the size of the object

C) retains the size of the object - **(Correct Answer)**

D) moves the object close to the origin

73. ___ transformation do not deform the object.

A) Shear

B) Translation - **(Correct Answer)**

C) Scaling

D) Reflection

74. In Cohen - Sutherland line clipping algorithm, a line segment with region codes 1001 and 0101 is :

A) completely within the window

B) completely outside the window - **(Correct Answer)**

C) partially within the window

D) on the window boundary

75. Computation in a circle drawing can be reduced by considering :

A) 3 - symmetry

B) 6 - symmetry

C) 8 - symmetry - **(Correct Answer)**

D) 10 - symmetry

76. Two curves are said to be connected at a point with first order continuity if :

A) Both curves simply meet at a point.

B) The tangents to both the curves at that point is equal. - **(Correct Answer)**

C) The curvature to both the curves at that point is equal.

D) There is discontinuity of both the curves at that point.

77. Medical imaging and similar application that require display of object cross sections commonly use ___ representation.

A) Octree — **(Correct Answer)**

B) Sweep

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C) Fractals

D) Planar

78. Matrix representation for 3D with respect to y - axis is represented as :

A) $\begin{pmatrix} \cos\theta & 0 & \sin\theta & 0 \\ 0 & 1 & 0 & 1 \\ -\sin\theta & 0 & \cos\theta & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$ - **(Correct Answer)**

B)

$\begin{pmatrix} \cos\theta & 0 & \sin\theta & 0 \\ -\sin\theta & 1 & \cos\theta & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

C) $\begin{pmatrix} 1 & 0 & 0 & 0 \\ \cos\theta & 1 & \sin\theta & 0 \\ -\sin\theta & 0 & \cos\theta & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ \cos\theta & 0 & \sin\theta & 0 \\ -\sin\theta & 0 & \cos\theta & 1 \end{pmatrix}$

79. When the projection is not perpendicular to the view plane, we have _____ projection.

A) orthographic

B) isometric

C) perspective

D) oblique — **(Correct Answer)**

80. In 3D viewing, the vector to refer the positive y -axis is called as :

A) view up vector - **(Correct Answer)**

B) normal vector

C) unit vector

D) planar vector

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81. A software process model is :

A) a representation of the way in which s/w is developed - **(Correct Answer)**

B) a representation of the way in which s/w processes the data

C) a representation of the way in which s/w is used

D) a representation of the way in which s/w may fail

82. Which one of the following models is not suitable for accommodating any changes ?

A) RAD Model

B) SPIRAL Model

C) WATERFALL Model - **(Correct Answer)**

D) PROTOTYPING model

83. Agile s/w development is based on :

A) Incremental approach

B) Iterative approach

C) Linear approach

D) Both incremental and iterative approaches - **(Correct Answer)**

84. Evolutionary prototyping is generally preferred than throwaway prototyping, because it.

A) allows reuse of the initial prototype - **(Correct Answer)**

B) does not require customer involvement

C) is more reliable

D) is more easier to develop the end product

85. Which of the following is desirable property of a module ?

A) Independency - **(Correct Answer)**

B) Low cohesiveness

C) High coupling

D) Multi-functional

86. In Object oriented design of software, objects have :

A) attributes and name only

B) attributes and operations only

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C) attributes, name and operations only - **(Correct Answer)**

D) operations and name only

87. A simple measure of reliability is Mean ___ Time ___ Between ___ Failure (MTBF) and is given by ___ . . . Where MTTF is Mean-Time To ___ ___ Failure and MTTR is Mean ___ Time To ___ ___ Repair.

A) MTTF-MTTR

B) MTTF+MTTR - **(Correct Answer)**

C) MTTR-MTTF

D) (MTTF-MTTR)X100%

88. Cyclomatic complexity metric provides designer with information regarding the number of :

A) Cycles in the program

B) Errors in the program

C) Independent logic paths in the program - **(Correct Answer)**

D) Statement in the program

89. One of the following standards is not related to software configuration management.

A) IEEE 828

B) IEEE 1042

C) ISO10007-1995

D) ISO 10007-2001 - **(Correct Answer)**

90. The approach of software testing is to design test cases to :

A) break the s/w - **(Correct Answer)**

B) understand the s/w

C) analyze the design of subprocesses in the s/w

D) analyze the o/p of the s/w

91. The location of a file on the internet is called its :

A) Uniform Resource Locator - **(Correct Answer)**

B) Uniform Resource Identity

C) Universal Resource Locator

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D) Universal Resource Identity

92. Javascript was created by :

A) Netscape - **(Correct Answer)**

B) Microsoft

C) IBM

D) Apple

93. Apache and IIS are popular :

A) Web servers - **(Correct Answer)**

B) Web browsers

C) Web protocols

D) Web client

94. HTTP status code for 'success' category starts with :

A) 1

B) 2 - **(Correct Answer)**

C) 3

D) 5

95. Which attribute in tag is used to specify text to be displayed when browsers are not able to display the image :

A) src

B) alt - **(Correct Answer)**

C) text

D) content

96. The ___ operator returns the second operand if the first operand is true, otherwise, returns the third operand.

A) Conditional operator - **(Correct Answer)**

B) Assignment operator

C) Relational operator

D) Logical operator

97. Which is the correct syntax for referring to an external script called "demo. is" ?

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A) <script src = "demo.js"> - **(Correct Answer)**

B) <script href = "demo.js">

C) <script ref = "demo.js">

D) <script name = "demo.js">

98. What will be the output of the following code ?

document. Write(" screen. width: " + screen. Width);

A) Browser length

B) Browser width - **(Correct Answer)**

C) Browser area

D) Error

99. Which attribute is used to provide an advisory text about an element or its contents ?

A) tooltip

B) dir

C) title - **(Correct Answer)**

D) head

100. What is the default type of 'type' attribute of element?

A) Text - **(Correct Answer)**

B) Password

C) Numerals

D) Special characters

101. Dr. M.S. Subbulakshmi has been distinguished in the field of :

A) Kathak

B) Bharatha Natiyam

C) Playing Violin

D) Vocal Music - **(Correct Answer)**

102. Find the value of $1+\frac{1}{1+\frac{1}{1+\frac{1}{3}}}$

A) $1\frac{7}{4}$

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B) $1\frac{3}{7}$

C $1\frac{4}{7}$ - **(Correct Answer)**

D) $1\frac{2}{7}$

103. Admiral Nelson took Doraisamy the son of Maruthu Pandyan as a prisoner to :

A) Penang - **(Correct Answer)**

B) Andaman

C) Singapore

D) Burma

104. A group that causes deepening of the colour is known as :

A) Hypochromic

B) Hyperchromic

C) Hypsochromic

D) Bathochromic - **(Correct Answer)**

105. Which of the following electron carrier carries two electrons and two H^+ from PS II to PS I Quantosome ?

A) Plastoquinones - **(Correct Answer)**

B) Plastocyanin

C) Ferridoxin

D) Cytochrome

106. Madras High Court was started in the year :

A) 1862 - **(Correct Answer)**

B) 1864

C) 1865

D) 1870

107. When did the design of National flag was adopted by the Constituent Assembly of India ?

A) 20 July 1947

B) 21 July 1947

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C) 22 July 1947 - **(Correct Answer)**

D) 23 July 1947

108. ___ established the Gandhi Ashram at Trichengodu.

A) Kamaraj

B) Rajaji - **(Correct Answer)**

C) Sathyamurthi

D) Subramaniya Ayyar

109. Veera Pandya Kattabomman was hanged on ___ .

A) October 1, 1799

B) October 10, 1799

C) October 16, 1799 - **(Correct Answer)**

D) October 17, 1800

110. River Periyar rises near :

A) Elamalai - **(Correct Answer)**

B) Agastyamalai

C) Devarmalai

D) Pushpagiri

PART-B

1. If the set A has 6 elements and the set B has 3 elements, then the number of functions from A to B is equal to :

A) 2

B) 18

C) 216

D) 729 - **(Correct Answer)**

2. In solving the system of equations $\begin{matrix} x+y+z=1 \\ 4x+3y-z=6 \\ 3x+5y+3z=4 \end{matrix}$ **by LU decomposition method the lower triangular matrix L is :**

A) $\begin{pmatrix} 1 & 0 & 0 \\ 4 & 1 & 0 \\ 3 & -2 & 1 \end{pmatrix}$ - **(Correct Answer)**

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B) $\begin{pmatrix} 1 & 0 & 0 \\ 5 & 1 & 0 \\ 1 & -2 & 1 \end{pmatrix}$

C) $\begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & 0 & 1 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 4 & 3 & 1 \end{pmatrix}$

3. Differential of cos $\left(\frac{1-x^2}{1+x^2}\right)$ with respect to $\tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)$ is :

A) 1/2

B) 3/2

C) 2/3

D) $\frac{1}{3}$

Correct Answer:- *

4. Find the maximum or minimum value of $f(x, y) = x^3 + y^3 - 3xy$.

A) - 1 - **(Correct Answer)**

B) 2

C) 1

D) - 2

5. If the signed binary numbers 1000 and 1001 (in two's complement form) are added, the result will be :

A) Correctly obtained with carry

B) Obtained after taking complement of the sum

C) Wrong as a result of overflow - **(Correct Answer)**

D) Correct as a result of overflow

6. The difference between hard microprogramming and soft microprogramming is that :

A) There is little difference between them

B) Hard microprograms are generally fixed and soft microprograms are changeable - **(Correct Answer)**

C) Hard microprograms are changeable and soft microprograms are fixed

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D) Hard microprogramming is really a hardwired control unit implementation

7. In a write through technique of memory write operation,

A) Only the cache is updated and main memory is never updated.

B) Both the cache memory and main memory are updated simultaneously. - **(Correct Answer)**

C) Only the cache location is updated and the modified block is sent to main memory later.

D) Only the main memory is updated with modified bit and cache updated later.

8. A major difference between CISC and RISC processors is that :

A) CISC processors have only load and store instructions to access memory.

B) CISC processors have complex instructions that can directly operate on memory operands. - **(Correct Answer)**

C) CISC processors have got an instruction set whereas RISC processors do not have any instructions set at all.

D) CISC processors are more suited to pipelined operation.

9. The following postfix expression with single digit operands is evaluated using a stack 823 ∧ (23 * + 51 * -

Note that ' ∧ ' is exponentiation operator the top two elements of the stack after the first '*' is evaluated are :

A) 6, 1 - **(Correct Answer)**

B) 5, 7

C) 3, 2

D) 1, 5

10. In a file which contains 1 million records and the order of the tree is 100 , then what is the maximum number of nodes to be accessed if B + tree index is used ?

A) 5

B) 4 - **(Correct Answer)**

C) 3

D) 10

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11. Let G be a complete undirected graph on 4 vertices, having 6 edges with weights being 1, 2, 3, 4, 5 and 6 . The maximum possible weight that a minimum weight spanning tree of G can have is :

A) 6

B) 7

C) 8 - **(Correct Answer)**

D) 9

12. The time complexing of the following C function is : (assume n > *o*) int recursive (int n)

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

A) 0(n)

B) 0(nlogn)

C) 0(n^2)

D) 0(2^n) - **(Correct Answer)**

13. A shared variable t, initialized to zero, is operated on by four concurrent processes W, X, Y, Z as follows. Each of the processes W and X reads t from memory, increments by one, stores it to memory, and then terminates. Each of the processes Y and Z reads t from memory, decrements by two, stores it to memory, and then terminates. Each process before reading t invokes the P operation (i.e., wait) on a counting semaphore S and invokes the V operation (i.e., signal)on the semaphore S after storing t to memory. Semaphore S is initialized to two. What is the maximum possible value of t after all processes complete execution ?

A) -2 - **(Correct Answer)**

B) -1

C) 1

D) 2

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14. The following two functions P1 and P2 that share a variable B with an initial value of 2 execute concurrently. P1() { $C = B - 1$ $B = 2^{*}C$ **} P2() {** $D = 2^{*} B;$ $B = D - 1;$ **} The number of distinct values that B can possibly take after the execution is :**

A) 3 - **(Correct Answer)**

B) 2

C) 5

D) 4

15. Match the following mechanisms for interrupting the execution of a process and their uses.

(i) Interrupt	(a) Call to an operating system function
(ii) Trap	(b) Reaction to an asynchronous external event
(iii) Supervisor Call	(c) Handling of a error or an exception condition

A) (i)-(a), (ii)-(b), (iii)-(c)

B) (i)-(c), (ii)-(a), (iii)-(b)

C) (i)-(b), (ii)-(c), (iii)-(a) - **(Correct Answer)**

D) (i)-(a), (ii)-(c), (iii)-(b)

16. Suppose a system has only three physical pages. Given the following sequence of virtual page references, which of the following is the number of page faults that are required using first-in-first out replacement policy. Initially, assume that the physical pages are not being used by any virtual page.

121132143112415621

A) 9 - **(Correct Answer)**

B) 10

C) 11

D) 12

17. Let relations r1 (A, B, C) and r2 (C, D, E) have the following properties : r1 has 20,000 tuples, r2 has 45,000 tuples, 25 tuples of r1 fit on one block, and 30 tuples of r2 fit on one block. Estimate the number of block accesses required, using Nested loop join strategies for r1 natural join r2. Consider the worst

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case where buffer can hold one block of each relation. Consider r1 as outer relation.

A) 30000800 - **(Correct Answer)**

B) 36001500

C) 2300

D) 2800

18. Which of the following relational algebra operations do not require the participating tables to be union-compatible ?

A) Union

B) Intersection

C) Difference

D) Join - **(Correct Answer)**

19. Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, N} and the set of functional dependencies {E, F} → G, F → {I, J}, {E, H} → {K, L}, K → M, L → N on R . What is the key for ?

A) {E, F}

B) {E, F, H} - **(Correct Answer)**

C) {E, F, H, K, L}

D. {E}

20. Consider R (A, B, C) with FDs {A → {B, C}, B → C, A → B, {A, B} → C}. The canonical cover for the given FD is :

A) A → C, C → B, B → A

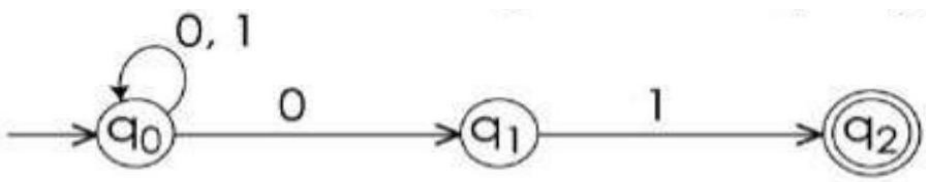
B) A → C, B → C, C → {A, B}

C) Both A → C, C → B, B → A and A → C, B → C, C → {A, B} - **(Correct Answer)**

D) A → C, B → A, C → B

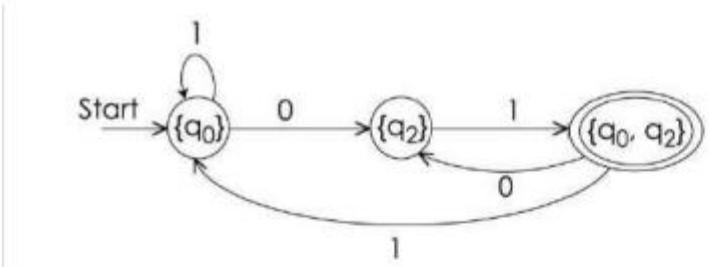
21. Consider the following NFA accepting all strings that end in 01.

Which is an equivalent DFA for the above NFA ?

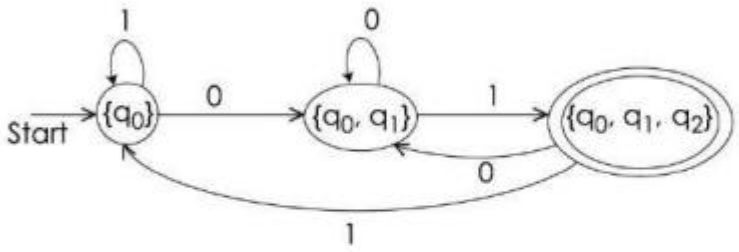


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A.

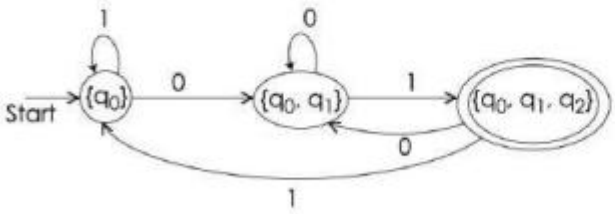


B :

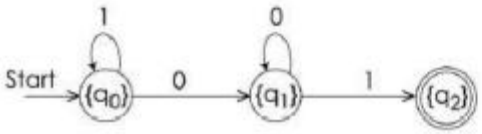


– (Correct Alternative)

C :



D :



22. Consider the PDA $P_N = (\{q\}, \{i, e\}, \{z\}, \delta_N, q, z)$ where δ_N is defined by $\delta_N(q, i, z) = \{(q, zz)\}\delta_N(q, e, z) = \{(q, \epsilon)\}$ is equivalent to the which of the following context free grammar ?

A) $G = (\{S\}, \{i, e\}, \{S \rightarrow iSS \mid e\}, S)$ - **(Correct Answer)**

B) $G = (\{S\}, \{i, e\}, \{S \rightarrow iSe|S|e\}, S)$

C) $G = (\{S\}, \{i, e\}, \{S \rightarrow iSe|A, A \rightarrow iAe|S \mid \in\}, S)$

D) $G = (\{S\}, \{i, e\}, \{S \rightarrow iAA, A \rightarrow iS|eS|e\}, S)$

23. Let $L = \{a^{nk} \mid K > 0$ and n is a positive integer constant $\}$ Which of the minimum number of states needed in a DFA to recognize L ?

A) K + 1

B) n + 1 - **(Correct Answer)**

C) 2^{n+1}

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D) 2^{K+1}

24. Code motion moves:

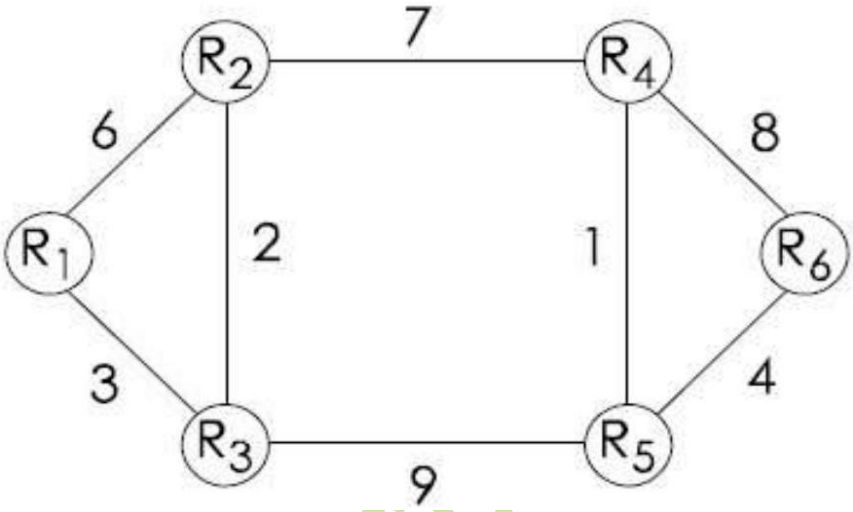
A) All instructions in the loop outside the loop

B) Loop - invariant instructions outside the loop

C) All instructions in the loop into the pre-header of the loop

D) loop - invariant instructions in the loop into the pre-header of the loop - **(Correct Answer)**

25. Consider a network with 6 routers R1 to R6 connected with links having weights as shown in the diagram.



All the routers use the distance vector based routing algorithm to update their routing tables. Each router starts with its routing table initialized to contain an entry for each neighbour with the weight of the respective connecting link. After all the routing tables stabilize, how many links in the network will never be used for carrying any data ?

A) 4

B) 3

C) 2 - **(Correct Answer)**

D) 1

26. Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links. (S_1) The computational overhead in linkstate protocols is higher than in distance vector protocols. (S_2) A distance vector protocol (with splithorizon) avoids persistent routing loops, but not a link state protocol. (S_3) After a topology change, a link stage protocol will coverage faster than adistance vector protocol. Which one of the following is correct about S_1, S_2 and S_3 ?

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A) S_1, S_2 and S_3 are all true.

B) S_1, S_2 and S_3 are all false.

C) S_1 and S_2 are true, but S_3 is false.

D) S_1 and S_3 are true, but S_2 is false. - **(Correct Answer)**

27. The size of the congestion window of a TCP connection is 32 KB when a timeout occurs. The round trip time of the connection 100 msec and the max. Segment size used is 2 KB . The time taken (msec) by the TCP connection to get back to 32 KB congestion window is :

A) 1100 to 1300 - **(Correct Answer)**

B) 800 to 1000

C) 1400 to 1600

D) 1500 to 1700

28. A graphical HTML browser resident at a network client machine Q accesses a static HTML webpage from a HTTP server S. The static HTML page has exactly one static embedded image which is also at S. Assuming no coaching, which one of the following is correct about the HTML webpage leading (including the embedded image ?)

A) Q needs to send atleast 2 HTTP requests to S, each necessarily in a separate TCP connection to server S.

B) Q needs to send atleast 2 HTTP requests to S, but a single TCP connection to server S is sufficient. - **(Correct Answer)**

C) A single HTTP request from Q to S is sufficient, and a single TCP connection between Q and S is necessary for this.

D) A single HTTP request from Q to S is sufficient, and this is possible without any TCP connection between Q and S.

29. The window to viewport transformation equation for a point (x_W, y_W) in a window to a point (x_V, y_V) in viewport co-ordinates is given as :

A)
$$x_v = x_{v\,\max} + (x_v - x_{v\,\min})\left(\frac{x_{v\,\max} - x_{v\,\min}}{x_{w\,\max} - x_{w\,\min}}\right)$$
$$y_v = y_{v\,\max} + (y_v - y_{v\,\min})\left(\frac{y_{v\,\max} - y_{v\,\min}}{y_{w\,\max} - y_{w\,\min}}\right)$$

B)

$$x_v = x_{v\min} + (x_w - x_{w\min})\left(\frac{x_{w\max} - x_{w\min}}{x_{v\max} - x_{v\min}}\right)$$
$$y_v = y_{v\min} + (y_w - y_{w\min})\left(\frac{y_{w\max} - y_{w\min}}{y_{v\max} - y_{v\min}}\right)$$

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C) $x_v = x_{v\min} + (x_w - x_{w\min})\left(\frac{x_{v\max} - x_{v\min}}{x_{w\max} - x_{w\min}}\right)$
$x_v = y_{v\min} + (y_w - y_{w\min})\left(\frac{y_{v\max} - y_{v\min}}{y_{w\max} - y_{w\min}}\right)$ – **(Correct Answer)**

D) $x_v = x_{v\min} + (x_v - x_{v\min})\left(\frac{x_{w\max} - x_{w\min}}{x_{v\max} - x_{v\min}}\right)$
$y_v = y_{v\min} + (y_v - y_{v\min})\left(\frac{y_{w\max} - y_{w\min}}{y_{v\max} - y_{v\min}}\right)$

30. The ___ representation is used to model water, trees, plants and mountains.

A) fractal - **(Correct Answer)**

B) voxel

C) pixel

D) octal

31. The expansion for NTSC is given as :

A) National television standards committee - **(Correct Answer)**

B) National telecommunication search committee

C) National television search committee

D) National telephonic standards committee

32. A ___ software provides an integrated environment for binding together all multimedia objects to create a full fledged multimedia application.

A) Image editing

B) Video editing

C) Audio editing

D) Authoring - **(Correct Answer)**

33. A task set is a collection of :

A) Engineering work tasks, milestones, deliverables - **(Correct Answer)**

B) Task assignments, cost estimates, metrics

C) Milestones, deliverables, metrics

D) Responsibilities, milestones, documents

34. The primary purpose of configuration status reporting is to ___ .

A) Allow revision of project schedule and cost estimates by project managers

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B) Make sure that change information is communicated to all affected parties - **(Correct Answer)**

C) Evaluate the performance of software development and organizations

D) Describe the defined risks

35. Where is the prototyping model of software development well suited ?

A) When requirements are well defined

B) For projects with large development teams

C) When a customer cannot define requirements clearly - **(Correct Answer)**

D) Change control task

36. A relational expression of the form E_1 < relational operator> E_2 where E_1 and E_2 are arithmetic expression denotes ___ .

A) Loop testing

B) Data flow testing

C) Conditional testing - **(Correct Answer)**

D) Validation testing

37. Memory required for IPV4 and IPV6 are :

A) 32 and 64 bits

B) 48 and 64 bits

C) 32 and 128 bits - **(Correct Answer)**

D) 64 and 128 bits

38. In servlet, which one is a interface used to describe the results of an SQL statement that has successfully been executed on a database ?

A) Java.sql.Result Set - **(Correct Answer)**

B) Java.sql.DAO

C) Java.sql.RDO

D) Java.sql.DDL

39. The command of Javascript window.set Interval ("update time( )", 100) performs :

A) It calls update time function for every 100 seconds.

B) It calls update time function for every 100 milliseconds. - **(Correct Answer)**

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C) It calls update time function after 100 minutes of delay.

D) It calls update time function only once after 100 seconds delay.

40. Which is a key e-CRM technique to tailor messages according to stated preferences or observed buying behaviour ?

A) Personalization - **(Correct Answer)**

B) Shopping cart

C) Targetting

D) Security

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