ENTRANCE EXAMINATION FOR ADMISSION, MAY 2013.

M.Tech. (NETWORK AND INTERNET ENGINEERING)

COURSE CODE : 394

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 394

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) or (E) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. The state of the process during context-switching is

(A) May be busy (B) May be idle

(C) Always busy (D) Always idle

(E) None of the above.

2. Which of the following is an advantage of interrupt-driven I/O over programmed I/O?

(A) Faster completion of I/O (B) Higher bandwidth availability

(C) Better CPU utilization (D) Faster I/O communication

(E) None of the above.

3. The threads may share all of the following except

(A) Address space (B) Open files

(C) Signals (D) All of the above

(E) None of the above.

4. The ability of an operating system to support multiple light weight processes within a single task or process is

(A) On-line processing (B) Multiprocessing

(C) Multithreading (D) Multiprogramming

(E) None of the above.

5. Which of the following memory management techniques may restricts the degree of multiprogramming?

(A) MVT (B) Paging

(C) Segmentation (D) All of the above

(E) None of the above.

6. A _____ is the buffer that holds output for a device such as printer, that cannot accept interleaved data streams.

(A) Spool (B) Directory

(C) Buffer (D) Queue

(E) None of the above.

7. Which of the following is the process by which a user's privileges ascertained ?

(A) Authorization (B) Authentication

(C) Access Control (D) All of the above

(E) None of the above.

8. When the priority queue is represented by max heap, the insertion and deletion of an element can be performed in (queue containing n elements)

(A) O(n) and O(1) respectively
(B) O(n) and O(n) respectively
(C) O(1) and O(1) respectively
(D) O(1) and O(n) respectively
(E) None of the above.

9. Process control blocks are read and/or modified by

(A) Scheduling module
(B) Resource allocation module
(C) Every module in the OS
(D) All of the above
(E) None of the above.

10. Which of the following is false?

(A) For deadlock minimum two processes required
(B) Minimum condition for deadlock is no pre-emption
(C) Deadlock prevention is dissatisfaction of one or more necessary condition for deadlock
(D) All of the above
(E) None of the above.

11. Which of the following switching techniques is most suitable for interactive traffic ?

(A) Circuit switching
(B) Message switching
(C) Packet switching
(D) All of the above
(E) None of the above.

12. In what protocol, it is possible for the sender to receiver an ACK for a packet that falls outside of its current window?

(A) Selective repeat
(B) Go back N
(C) Stop & wait
(D) All of the above
(E) None of the above.

13. A token ring is operated in _____ mode.

(A) Transmit mode
(B) Listen mode
(C) By pass mode
(D) All of the above
(E) None of the above.

14. What flag is used to take care of "out of band" data, in TCP header?

(A) RST
(B) SYN
(C) URG
(D) OUT
(E) None of the above.

15. Sliding window protocol is used by

(A) Connection less protocols
(B) Connection oriented protocols
(C) Datagram oriented circuits
(D) All of the above
(E) None of the above.

16. Which of the following schemes are used to ensure transaction atomicity?

(A) Differed database log modification
(B) Shadow paging
(C) Immediate database log modification
(D) All of the above
(E) None of the above.

17. Which of the following is a correct statement?

(A) Every subordinate entity is a week entity
(B) Every weak entity is a subordinate entity
(C) Relations produced from an ER model will always be in BCNF
(D) All of the above
(E) None of the above.

18. The collection of information stored in database of a particular moment is

(A) View
(B) Schema
(C) Instance
(D) Sub schema
(E) None of the above.

19. The tables generated on compilation of data definition language are stored in

(A) Data abstraction
(B) Meta data
(C) Data dictionary
(D) All of the above
(E) None of the above.

20. "M-Commerce" refers to

(A) A myth which does not exist in reality
(B) The ability of business to reach potential customers wherever they are
(C) The ability to have large capacity of memory storage dealing trade and commerce
(D) All of the above
(E) None of the above.

21. Which of the following uses overflow pages?

(A) B tress
(B) B^+ trees
(C) ISAM trees
(D) All of the above
(E) None of the above.

22. Consider a transaction has executed with isolation level 'Repeatable Read'. Which of the following problem may arise?

(A) Lost update problem
(B) Uncommitted read problem
(C) Phantom phenomenon problem
(D) All of the above
(E) None of the above.

23. Which of the following is a false statement?

(A) Wound-wait protocol prevents starvation
(B) Timer out can be used for deadlock recovery
(C) Thomas write rule allows all view serializable schedules
(D) All of the above
(E) None of the above.

24. A relation R is in 3NF but not in BCNF. Which of the following is a false statement?

(A) The relation R will have insertion anomaly
(B) The relation R may have deletion anomaly
(C) The relation R will not have data redundancy
(D) All of the above
(E) None of the above.

25. What is the order of each of the following tasks respectively?

(i) Inserting a single item into a binary search tree containing n items, in the average case

(ii) performing a Towers of Hanoi algorithm with n disks

(A) $O(2^n)$ & $O(Log_2 n)$
(B) $O(Log\ n_2)$ & $O(2^n)$
(C) $O(n^2)$ & $O(n^2)$
(D) $O(2n)$ & $O(n^2)$
(E) None of the above.

26. In C++, Dynamic binding is used in

(A) Only private methods
(B) Only public methods
(C) Only virtual methods
(D) All of the above
(E) None of the above.

27. What is the default copy semantics for objects of a class for which no copy constructor is defined?

(A) Member-wise memory copy
(B) Deep copy
(C) Undefined
(D) All of the above
(E) None of the above.

28. Which of the following is true in the context of comparing Breadth First Search (BFS) and Depth First Search (DFS) of a graph?

(A) BFS generates the minimum spanning tree

(B) BFS uses less space compared to DFS

(C) BFS finds the shortest path from start node to any give node

(D) All of the above

(E) None of the above.

29. The time complexity of creating a heap of 'n' elements by adding one element at a time is

(A) O(n)

(B) O(log n)

(C) O(n log n)

(D) All of the above

(E) None of the above.

30. The terminal nodes of a binary tree occur in the same relative position in

(A) Preorder, inorder

(B) Inorder, postorder

(C) Preorder, postorder

(D) All of the above

(E) None of the above.

31. In quick sort algorithm, if the pivot is the largest element then it becomes

(A) Insertion sort

(B) Bubble sort

(C) Selection sort

(D) Heap sort

(E) None of the above.

32. How many true inclusion relations are there of the form $A \subseteq B$, where A and B are subsets of a set S with n elements?

(A) $2^n + 1$

(B) $2^n + 3$

(C) $2^{2n} + 1$

(D) All of the above

(E) None of the above.

33. A n-vertex complete graph will have how many spanning trees?

(A) n^{n-1}

(B) n^{n-2}

(C) n^{n-3}

(D) All of the above

(E) None of the above.

34. The following items are inserted into binary search trees 3,6,5,2,4,7,1. Which node is the deepest?

(A) 1

(B) 3

(C) 4

(D) 2

(E) None of the above.

35. Which algorithm is used to compute minimum spanning tree?

(A) Boruvka's Algorithm
(B) Reverse-Delete Algorithm
(C) Kruskal's Algorithm
(D) All of the above
(E) None of the above.

36. FORTRAN and C are

(A) Regular languages
(B) Context free languages
(C) Context sensitive languages
(D) Not having grammar
(E) None of the above.

37. It is un-decidable whether

(A) A Turing Machine prints a specific letter
(B) A Turing Machine can compute the product of two numbers
(C) A Turing Machine can compute the primes
(D) All of the above
(E) None of the above.

38. The language accepted by a push down automata where the stack is limited to 1000 states is best described as

(A) Context free
(B) Regular
(C) Deterministic context free
(D) All of the above
(E) None of the above.

39. For a finite automata of n states the maximum length of strings that must be considered to distinguish two states is

(A) n
(B) n-1
(C) n-2
(D) All of the above
(E) None of the above.

40. The intersection of a CFL and a regular language is

(A) Need not be regular
(B) Need not be context free
(C) Is always regular
(D) All of the above
(E) None of the above.

41. The class of NP languages are not closed under

(A) Union
(B) Concatenation
(C) Complementation
(D) All of the above
(E) None of the above.

49. A computer has 4 K word cache with 4-way set associative with 64 words/block the number of set and word field bits are

(A) 15, 4 (B) 4, 6

(C) 4, 12 (D) 4, 4

(E) None of the above.

50. RAID configuration of disks are used to provide

(A) Fault – Tolerance (B) High speed

(C) High data density (D) All of the above

(E) None of the above.

51. If the Processor has 16 address lines and 12 data lines, what is the maximum number of opcodes the processor handles?

(A) 2^8 (B) 2^{16}

(C) 2^{12} (D) All of the above

(E) None of the above.

52. A switch – tail ring counter is made by using a single D flip flop. The resulting circuit is a

(A) JK-FF (B) D-FF

(C) T-FF (D) All of the above

(E) None of the above.

53. Flip – Flop is a

(A) Multistable Multivibrator (B) Monostable multivibrator

(C) Bistable multivibrator (D) All of the above

(E) None of the above.

54. The minimum number of NAND gates required to implement the Boolean function A + AB' + AB'C is equal to

(A) 1 (B) 4

(C) 7 (D) All of the above

(E) None of the above.

55. For a sequence detector, the minimum number of states required to detect n-bit sequence are

(A) 2n (B) n – 1

(C) n (D) All of the above

(E) None of the above.

42. Let L denote the language generated by the grammar $S \rightarrow 0S0 \mid 00$. Which of the following is true?

(A) L is not regular
(B) L is context free but not regular
(C) L is not context free
(D) All of the above
(E) None of the above.

43. Top down parsing techniques

(A) Simulate a leftmost derivation
(B) Simulate the reverse of a rightmost derivation
(C) Simulate a rightmost derivation
(D) All of the above
(E) None of the above.

44. Every LR(0) grammar is

(A) An LR(1) grammar
(B) Sometimes not a LR(1) grammar
(C) Sometimes a LR(1) grammar
(D) All of the above
(E) None of the above.

45. In the grammar

$E \rightarrow E+T \mid T$

$T \rightarrow i$

(A) + is left associative
(B) + is right associative
(C) Can't be decided
(D) All of the above
(E) None of the above.

46. How many half adders are requiring constructing n-bit parallel adder?

(A) $2 * n$
(B) $2 * n+1$
(C) $2 * n-1$
(D) All of the above
(E) None of the above.

47. Which of the following logic family is fastest?

(A) ECL
(B) TTL
(C) DTL
(D) All of the above
(E) None of the above.

48. Relative base addressing is relevant for writing

(A) Co-routines
(B) Position – independent routines
(C) Interrupt handlers
(D) All of the above
(E) None of the above.

49. A computer has 4 K word cache with 4-way set associative with 64 words/block the number of set and word field bits are

(A) 15, 4 (B) 4, 6

(C) 4, 12 (D) 4, 4

(E) None of the above.

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(A) 2n (B) n – 1

(C) n (D) All of the above

(E) None of the above.

56. The post order traversal of a binary tree is DEBFCA. Find out the preorder traversal.

(A) ABFCDE (B) ADBFEC

(C) ABDECF (D) ABDCEF

(E) None of the above.

57. Consider a disk drive that has a capacity of 8 Gigabytes (assume 1GB = 1,000,000,000 bytes). If that drive has 5 platters (assume that both sides are used), 10,000 tracks per surface, and an average of 200 sectors per track, how many bytes are in each sector?

(A) 800 bytes per sector (B) 400 bytes per sector

(C) 200 bytes per sector (D) 100 bytes per sector

(E) None of the above.

58. If λ is an Eigen value of an orthogonal matrix then its other Eigen value is

(A) $1/\lambda$ (B) $-\lambda$

(C) λ^2 (D) All of the above

(E) None of the above

59. If R and S are transitive relations then which of the following is false?

(A) $R \cap S$ is transitive (B) $R \cup S$ is transitive

(C) $R \cap S$ is symmetric (D) $R \cup S$ is symmetric

(E) None of the above.

60. Let S = {(1,2), (2,1)} is a binary relation on a set A = {1,2,3}. The minimum number of ordered pairs that are to be added to S to make it an equivalence relation is

(A) 1 (B) 2

(C) 3 (D) All of the above

(E) None of the above.

61. How many substrings can be formed from a character string of length 'n"?

(A) 2^n (B) $(n(n+1))/2$

(C) n^2 (D) All of the above

(E) None of the above.

62. The chromatic number of a star graph with 'n' vertices is

(A) 2 (B) $n - 1$

(C) 4 (D) All of the above

(E) None of the above.

63. If a set A has 3 elements then the number of elements in the power set of A × A is

(A) 128 (B) 256

(C) 512 (D) All of the above

(E) None of the above.

64. If a random variable X has a uniform distribution in the interval (4,7), then its variance is

(A) 1/4 (B) 1/2

(C) 3/4 (D) All of the above

(E) None of the above.

65. Consider a logical address space of 8 pages of 1024 words mapped with memory of 32 frames. How many bits are there in the physical address?

(A) 9 bits (B) 11 bits

(C) 13 bits (D) 15 bits

(E) None of the above.

66. MODEMS and other equipments used to send serial data over long distances are called as

(A) DTE (B) DCE

(C) Data set (D) All of the above

(E) None of the above.

67. The voltage range used in RS232 interface for 1 level is

(A) –3 V to 15 V (B) –5 V to 15 V

(C) +5 V to 15 V (D) All of the above

(E) None of the above.

68. Which memory is difficult to interface with processor?

(A) Static memory (B) Dynamic memory

(C) ROM (D) All of the above

(E) None of the above.

69. If an integer needs two bytes of storage, then the maximum value of unsigned integer is

(A) $2^{16} - 1$ (B) $2^{15} - 1$

(C) 2^{16} (D) 2^{15}

(E) None of the above.

70. Which of the following can be determined from a frequency-domain graph of a signal?

(A) Bandwidth (B) Phase

(C) Power (D) Energy

(E) None of the above.

71. Why should testing be done?

(A) To ensure the correctness of a program

(B) To find errors in a program

(C) To certify the effectiveness of a program

(D) All of the above

(E) None of the above.

72. Which phase consumes maximum effort to fix an error?

(A) Design phase (B) Coding phase

(C) Analysis phase (D) All of the above

(E) None of the above.

73. Debugging of a program is

(A) The process of executing the program

(B) The process of experiencing a failure

(C) The process of improving the quality of the program

(D) All of the above

(E) None of the above.

74. Cyclomatic complexity is meant for

(A) Number of distinct paths in a graph (B) Defect detector

(C) Number of distinct regions in a graph (D) All of the above

(E) None of the above.

75. A node with indegree = 0 and outdegree $\neq$ 0 is called as _____ and a node with indegree $\neq$ 0 and outdegree = 0 is called as _____.

(A) Source node, Destination node (B) Destination node, Source node

(C) Predicate node, Leaf node (D) Leaf node, Predicate node

(E) None of the above.

76. What is the IEEE standard for SRS document?

(A) IEEE std. 830 (B) IEEE std. 829

(C) IEEE std. 860 (D) IEEE std. 801.12

(E) None of the above.

77. Which is not a component of a use case diagram?

(A) Actor

(B) Use case

(C) Relationship between actor and use case

(D) All of the above

(E) None of the above.

78. Use case scenario is

(A) An input of a use case

(B) An instance of a use case

(C) An information of a use case

(D) All of the above

(E) None of the above.

79. The number of interchanges required to sort 5, 1, 6, 2 4 in ascending order using Bubble Sort is

(A) 6

(B) 5

(C) 7

(D) 8

(E) None of the above.

80. The goal of hashing is to produce a search that takes

(A) O(1) time

(B) $O(n^2)$ time

(C) O(log n) time

(D) O(n log n) time

(E) None of the above.

81. Let R be a relation on the set A, where A is set of all positive integers. R is defined by x R y if and only if $x \leq 3y$ then R is

(A) Symmetric

(B) Transitive

(C) Reflexive

(D) All of the above

(E) None of the above.

82. A file produced by a spreadsheet

(A) is generally stored on disk in an ASCII text format

(B) can be used as it by the DBMS

(C) can be used for graphic

(D) All of the above

(E) None of the above

83. Which type of file is part of the Oracle database?

(A) Control file
(B) Password file
(C) Parameter files
(D) Archived log files
(E) None of the above.

84. $(\sim Q \rightarrow \sim P) \vee Q \Leftrightarrow$

(A) $\sim P$
(B) $P \rightarrow Q$
(C) $Q \rightarrow P$
(D) All of the above
(E) None of the above.

85. A complete Bipartite graph $K_{m,n}$ is a tree if and only if

(A) $m = n$
(B) $m = n = 1$
(C) $m = 1$ or $n = 1$
(D) All of the above
(E) None of the above

86. The number of labelled trees with five vertices is

(A) 125
(B) 25
(C) 625
(D) All of the above
(E) None of the above.

87. Context-switching takes place in

(A) Round-Robin scheduling
(B) Any Pre-emptive scheduling
(C) Priority scheduling
(D) All of the above
(E) None of the above.

88. In the _____ approach, devices are associated with logical primary memory addresses rather than having a specialized device address.

(A) I/O Mapped I/O
(B) Interrupt Mapped I/O
(C) Memory Mapped I/O
(D) All of the above
(E) None of the above.

89. Concurrent process are

(A) Do not overlap in time
(B) Overlap in time
(C) Executed by a processor at the same time
(D) All of the above
(E) None of the above.

90. Match the following

(P)	Paging	(1)	Spatial Locality
(Q)	Overlays	(2)	Programmer's view of Memory allocation
(R)	Segmentation	(3)	Non – Contiguous allocation
(S)	TLB	(4)	Independent modules

(A) P – 1, Q – 2, R – 3, S – 4 (B) P – 2, Q – 3, R – 1, S – 4

(C) P – 3, Q – 4, R – 2, S – 1 (D) P – 1, Q – 3, R – 4, S – 2

(E) None of the above.

91. Suppose all the bits in the IP4 packet including the internet checksum are overwritten by all 0's or all 1's , then how to catch that error.

(A) Ethernet checksum can be used to detect the error

(B) TTL field value can be used

(C) Version field value can be used to detect the error

(D) All of the above

(E) None of the above

92. In TCP, both sides of a TCP connection randomly choose an initial sequence number because

(A) To avoid the segments from an already terminated connection

(B) To accept the packets from both the connections

(C) As so many sequence numbers available, this will be done

(D) All of the above

(E) None of the above

93. When is the SGA created in an Oracle database environment?

(A) When the database is created (B) When a user process is started

(C) When the database is mounted (D) When the instance is started

(E) None of the above.

94. A network that requires human intervention of route signals is called a

(A) Bus Interface network (B) Ring network

(C) Star Optional network (D) T-switched network

(E) None of the above.

95. In DNS, the client could directly contact more than one server is known as

(A) A recursive resolution
(B) An iterative resolution
(C) A Cache resolution
(D) An instance resolution
(E) None of the above.

96. A class B network on the internet as a subnet mask of 255.255.240.0. What is the maximum number of hosts per subnet?

(A) 4094
(B) 3094
(C) 1024
(D) All of the above
(E) None of the above.

97. Which is not a size metric?

(A) Number of attributes per class
(B) Number of methods per class
(C) Weighted methods per class
(D) All of the above
(E) None of the above.

98. Which of the following is not a standard RS-232C signal?

(A) RTS
(B) CTS
(C) DSR
(D) VDR
(E) None of the above.

99. Usability does not consists of

(A) Accuracy
(B) Learnability
(C) Completeness
(D) All of the above
(E) None of the above.

100. _____ Supports Data Rate Upto 1000 Mbps Gigabyte Ethernet.

(A) CAT 1
(B) Thinnet
(C) CAT 5d
(D) CAT 5e
(E) None of the above.