

ROY'S INSTITUTE OF COMPETITIVE EXAMINATION

The West Bengal Central School Service Commission

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COMPUTER APPLICATION

[CLASSES : XI - XII]

1. The maximum data rate of a channel of 3000 Hz bandwidth and SNR of 30 dB is
(A) **30,000 bps**
(B) 15,000 bps
(C) 60,000 bps
(D) 3,000 bps
2. $y = ab + \bar{a}b + \bar{b}c$
The above given boolean expression after minimization is
(A) $a + bc$
(B) $ab + c$
(C) bc
(D) **$b + c$**
3. The minimum number of NOR gates required to implement a NAND gate is
(A) 3
(B) **4**
(C) 5
(D) 2
4. The worst-case time-complexity of the quick sort algorithm is
(A) n
(B) $\log n$
(C) **n^2**
(D) $n \log n$
5. To print 'a' and 'b' which printf() statement can be used?
(A) **printf ("%f %f", a, b);**
(B) printf ("%i %f", a, b);
(C) printf ("%f %s", a, b);
(D) printf ("%f %c", a, b);
6. #include <stdio.h>
int main (void)
{ int new = 5;
printf ("%d", new);
}
What happens if the above given program is executed in C and C++?
(A) Error in C and successful execution in C++
(B) Error in both C and C++
(C) **Error in C++ and successful execution in C**
(D) A successful execution in both C and C++
7. A Priority Queue is implemented as a Max-Heap. Initially it has 5 elements. The level order traversal of the Heap is — 10, 8, 5, 3, 2. Sequentially 1 and 7 are inserted in the Heap. The Level Order Traversal of the Heap is now –
(A) 10, 8, 7, 5, 3, 2, 1
(B) 10, 8, 7, 2, 3, 1, 5
(C) 10, 8, 7, 1, 2, 3, 5
(D) **10, 8, 7, 3, 2, 1, 5**

Disclaimer : Every effort has been made to ensure that the answer keys provided herein are accurate to the best of our understanding. These are for reference purpose only and should not be considered as the official answers. The purpose is to help the examinees to analyse their performance in competitive examinations.

8. $a \rightarrow b$ is syntactically correct if
 (A) 'a' and 'b' are structures.
 (B) 'a' is a pointer to a structure and 'b' is a structure.
 (C) 'a' is a pointer to a structure in which 'b' is a field.
(D) 'a' is a structure and 'b' is a pointer to a structure.
9. A machine needs a minimum of 100 sec to sort 1000 names by quick sort. The minimum time needed to sort 100 names will be approximately
 (A) 72.7 sec.
 (B) 50.2 sec.
(C) 6.7 sec.
 (D) 11.2 sec.
10. Technique used by the CPU to repeatedly check the status of an input/output (I/O) device to determine whether it is ready for data transfer –
 (A) Spooling
(B) Polling
 (C) Masking
 (D) Scrubbing
11. A disc scheduling algorithm in an operating system causes the disc arm to sweep back and forth across the disc surface servicing all request in its path. The algorithm is
 (A) SSTF
 (B) FCFS
 (C) Eschenback scheme
(D) SCAN
12. The employee's salary should not be greater than Rs. 1,50,000. This is an example of:
(A) Integrity constraint
 (B) Referential constraint
 (C) Over defined constraint
 (D) Feasibility constraint
13. Among the following the fastest memory device is
 (A) Hard Disk
(B) Cache
 (C) Flash Drive
 (D) RAM
14. Where the bootstrap loader program is stored?
 (A) RAM
(B) ROM
 (C) Hard disc
 (D) Register
15. Which keyword is used with where clause to search for a pattern?
 (A) FIND
(B) LIKE
 (C) SEARCH
 (D) PATTERN
16. Convert $(72164.56)_8$ to its equivalent Hexadecimal representation.
 (A) 7464.B8
 (B) 7474.C8
(C) 7474.B8
 (D) 7474.B7
17. The minimum number of flip-flops required to construct a Mod-19 counter is
(A) 5
 (B) 6
 (C) 7
 (D) 8
18. Which of the following statement (in connection with Digital Logic) is true?
 (A) $(A+B)(A+C)=AC+BC$
 (B) $(A+B)(A+C)=AB+C$
(C) $(A+B)(A+C)=A+BC$
 (D) $(A+B)(A+C)=AC+B$
19. Which of the following is not a member of a class?
(A) friend function
 (B) static function
 (C) virtual function
 (D) inline function

20. The range of integers that can be represented by a 2's complement number system is _____. Here, 'n' is the number of bits required to represent an integer.
- (A) -2^{n-1} to 2^{n-1}
(B) -2^{n-1} to $(2^{n-1} - 1)$
 (C) $(-2^{n-1} + 1)$ to $(2^{n-1} - 1)$
 (D) $(-2^{n-1} - 1)$ to $(2^{n-1} - 1)$
21. What is the equivalent pointer expression for referring the array element $a[i][j][k][1]$?
- (A) $*(((a + i) + j) + k) + 1$
(B) $*(*(* (a + i) + j) + k) + 1$
 (C) $*((a + i) + j) + k + 1$
 (D) $((a + i) + j + k + 1)$
22. Relation R (M,N,P,Q) contains the functional dependencies $F = \{M \rightarrow N, N \rightarrow P, P \rightarrow Q\}$. The decomposition of 'R' into R_1 (M, N, P) and R_2 (N, P, Q) is
- (A) lossy
 (B) lossy dependency preserving
(C) lossless
 (D) None of the above
23. Let A = 1111 1010 and B = 0000 1010 be two 8-bit 2's complement numbers. Their product in 2's complement is
- (A) 1101 0101
(B) 1100 0100
 (C) 1001 1100
 (D) 1010 0101
24. Let R(A, B, C, D, E, F) be a relation schema with the following functional dependencies:
 $F = \{C \rightarrow F, E \rightarrow A, EC \rightarrow D, A \rightarrow B\}$.
 One of the key in 'R' is
- (A) CD
(B) EC
 (C) AE
 (D) AC
25. The maximum Window Size for data transmission using selective reject protocol with n-bit frame sequence number is
- (A) 2^n
 (B) 2^{n-1}
(C) $2^n - 1$
 (D) 2^{n-2}
26. Which of the following is true in case of a pure virtual function in C++?
- (A) It has no definition in class declaration.**
 (B) It can not be overridden.
 (C) It is defined in base-class and overridden in derived class.
 (D) It can only be called by the base-class.
27. The decimal number 80 is represented in BCD code as
- (A) 10000001
 (B) 01010000
 (C) 00100000
(D) 10000000
28. The programming language that uses an interpreter is
- (A) C
 (B) C++
 (C) FORTRAN
(D) RUBY
29. Dirty bit is used to show the
- (A) Page with corrupted data
 (B) The wrong page in the memory
(C) Page that is modified after being loaded into cache-memory
 (D) Page that is less frequently accessed
30. The minimum number of NAND gates required to implement the boolean function $A + A\bar{B} + A\bar{B}C$ is
- (A) 0**
 (B) 1
 (C) 3
 (D) 4

31. Given the page reference string 7, 0, 1, 2, 0, 3, 0, 4, the number of page-faults using the LRU algorithm with 3 frames is
 (A) 4
 (B) 5
(C) 6
 (D) 7
32. Which SQL command is used to delete a table?
 (A) delete
 (B) truncate
 (C) remove
(D) drop
33. A computer system has 6 tape drives, with 'n' processes competing for them. Each process may need 3 tape drives. The maximum value of 'n' for which the system is guaranteed to be deadlock free is
 (A) 4
(B) 3
 (C) 2
 (D) 1
34. The number of swappings needed to sort the numbers 8, 22, 7, 9, 31, 19, 5, 13 in ascending order using bubble sort is
 (A) 11
 (B) 12
 (C) 13
(D) 14
35. Threads share amongst themselves which of the following resources?
 (A) Register set
(B) Global variables
 (C) Program counter
 (D) Stack pointer
36. $f = A.B.C.D + A.C.D + A.D$
 The simplification of the above given Boolean function is:
(A) $A.D$
 (B) $B.C$
 (C) $A.D + C$
 (D) None of the above
37. for (i=3; i<15; i+=3)
 {
 printf ("%d", i);
 ++i;
 }
 The above given program code will produce which of the following output?
 (A) 3 6 9 12
 (B) 3 6 9 12 15
 (C) 3 7 11 15
(D) 3 7 11
38. What is the maximum height of any AVL-tree with 7 nodes? Assume that the height of a tree with a single node is 0.
 (A) 2
(B) 3
 (C) 4
 (D) 5
39. The minimum number of stacks required to implement a Queue is
 (A) 3
 (B) 1
(C) 2
 (D) 4
40. The binary equivalent of the octal number $(13.54)_8$ is
(A) $(1011.1011)_2$
 (B) $(1101.1110)_2$
 (C) $(1001.1110)_2$
 (D) $(1010.1011)_2$

41. Spooling is most beneficial in multiprogramming environment where
(A) Most jobs are I/O bound
 (B) Most jobs are CPU bound
 (C) There is limited primary memory and need for secondary memory
 (D) Jobs are evenly divided as I/O bound and CPU bound
42. If there are 32 segments in a memory, each with size 1K byte, then the Logical Address should have _____ bits.
(A) 15
 (B) 13
 (C) 14
 (D) 16
43. The range of IP-addresses from 224.0.0.0 to 239.255.255.255 are reserved for
 (A) Loopback
 (B) Broadcast
(C) Multicast packets
 (D) Future addressing
44. The equivalent postfix expression for the infix expression $A+B * (C+D) / F+D * E$ is
 (A) $AB+CD+*F/D+E*$
(B) $ABCD+*F/+DE*+$
 (C) $A*B+CD/F*DE++$
 (D) $A+*BCD/F*+DE++$
45. The decimal number +122 is expressed in 2's complement form as
 (A) 01110010
 (B) 10000101
 (C) 01001011
(D) 01111010
46. $y = \overline{(A+B+C+D)}.(\overline{A}+B)$
 The SOP form of the above given function is
(A) $y = \overline{A}BC\overline{D} + \overline{A}B$
 (B) $y = \overline{A}\overline{B}\overline{C}D + \overline{A}B$
 (C) $y = \overline{A}\overline{B}\overline{C}D + \overline{A}\overline{B}$
 (D) $y = \overline{A}\overline{B}\overline{C}D + \overline{A}B$
47. The number of 2-input multiplexers required to design a 2^{10} -input multiplexer is
 (A) 31
 (B) 10
 (C) 127
(D) 1023
48. The subnet mask for a particular network is 255.255.31.0. Which of the following pair of IP-addresses belong to this network?
 (A) 172.57.88.62 and 172.56.87.233
 (B) 10.35.28.2 and 10.35.29.4
 (C) 191.203.31.87 and 191.234.31.88
(D) 128.8.129.43 and 128.8.161.55
49. The shortcut key for superscript character in MS Word is
 (A) Alt Ctrl ++
(B) Ctrl Shift +
 (C) Ctrl++
 (D) Alt Shift ++
50. If 'p' is a pointer to an integer and 't' is a pointer to a character then sizeof (p) will be
 (A) Greater than that of sizeof (t)
 (B) Less than that of sizeof (t)
(C) Same as that of sizeof (t)
 (D) None of the above

51. Consider the relation R (A, B, C, D, E) with functional dependencies:
 $\{A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow E\}$
 Find the highest normal form of R.
 (A) 1NF
(B) 2NF
 (C) 3NF
 (D) BCNF
52. $(3 * 4096 + 15 * 256 + 5 * 16 + 3)$
 The total number of 1s in the binary representation of the above given expression is
 (A) 8
 (B) 9
(C) 10
 (D) 12
53. Error detection at the Data Link Layer is achieved by
 (A) bit stuffing
 (B) pulse codes
 (C) equalization
(D) cyclic redundancy codes
54. The time-complexity of Banker's algorithm is $O(x^2y)$ where x is the number of active processes and y is the number of
 (A) Remaining cycle of executions
 (B) Releasing processes
(C) Resources
 (D) Remaining number of resources
55. Given the functional dependencies $\{X \rightarrow Y, Y \rightarrow Z, X \rightarrow W, Z \rightarrow PQ\}$, which of the following doesn't hold good?
 (A) $X \rightarrow Z$
(B) $W \rightarrow Z$
 (C) $X \rightarrow YW$
 (D) None of the above
56. A data dictionary doesn't provide information about –
 (A) Where data is located
 (B) How the data is used
(C) Size of the data storage disk
 (D) Who owns or is responsible for the data
57. Which implementation is optimal to find an element at K^{th} position in a Linked List?
 (A) Singly Linked List
 (B) Doubly Linked List
 (C) Circular Linked List
(D) Array Implementation of Linked List
58. Which of the following is an output device?
(A) Plotter
 (B) Memory Card
 (C) UPS
 (D) SMPS
- 59.
- | Process | P_0 | P_1 | P_2 |
|------------|-------|-------|-------|
| Burst Time | 5 | 7 | 2 |
- The average waiting time using the shortest job first algorithm for the above table is
 (A) 1
 (B) 0
 (C) 4.66
(D) 3
60. How is a single channel shared by multiple signals in a computer network?
(A) Multiplexing
 (B) Phase modulation
 (C) Analog modulation
 (D) Digital modulation