Computer Science Engineering Sample Papers

1 The order of an internal node in a B+ tree index is the maximum number of children it can have. Suppose that a child pointer takes 6 bytes, the search field value takes 14 bytes, and the block size is 512 bytes. What is the order of the internal node?

A) 24
B) 25
C) 26
D) 27
Answer : (C)

2 The Boolean function x, y, + xy + x, y

A) x, + y,
B) x + y
C) x + y,
D) x, + y
Answer : (D)

3 In an MxN matrix such that all non-zero entries are covered in a rows and b columns. Then the maximum number of non-zero entries, such that no two are on the same row or column, is

A) £ a + b
B) £ max {a, b}
C) £ min {M-a, N-b}
D) £ min {a, b}
Answer : (A)

4 The relation scheme Student Performance (name, courseNo, rollNo, grade) has the following functional dependencies:

A) name, courseNo -> grade
B) rollNo, courseNo -> grade
C) name -> rollNo
D) rollNo -> name
The highest normal form of this relation scheme is
Answer : (A)

5 The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by

A) the instruction set architecture
B) page size
C) physical memory size
D) number of processes in memory
Answer : (D)

6 Let G be a simple graph with 20 vertices and 100 edges. The size of the minimum vertex cover of G is 8. Then, the size of the maximum independent set of G is
A) 12

B) 8
C) Less than 8
D) More than 12
Answer : (A)

7 What does the following algorithm approximate? (Assume m > 1, Î > 0).
x = m;
y-i;
while (x - y > Î)
{ x = (x + y) / 2 ;
y = m/x ;
}
print (x) ;
A) log m
B) m^2
C) $m^{1/2}$
D) $m^{1/3}$
Answer : (C)

8 Consider the following C program
main ()
{ int x, y, m, n ;
scanf ("%d %d", &x, &y);
/ * Assume x > 0 and y > 0 * /
m = x; n = y ;
while (m ! = n)
{ if (m > n)
m = m — n;
else
n = n - m ; }
printf("%d",n); }
The program computes
A) x + y, using repeated subtraction
B) x mod y using repeated subtraction
C) the greatest common divisor of x and y
D) the least common multiple of x and y
Answer : (C)

9 The best data structure to check whether an arithmetic expression has balanced parentheses is a
A) queue
B) stack
C) tree
D) list
Answer : (B)

10 A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8,5,3,2 Two new elements 1 and 7 are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is
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
Answer : (D)

11 An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be
A) 255.255.0.0
B) 255.255.64.0
C) 255.255.128.0
D) 255.255.252.0
Answer : (D)

12 Suppose the round trip propagation delay for a 10 Mbps Ethernet having 48-bit jamming signal is 46.4 ms. The minimum frame size is:
A) 94
B) 416
C) 464
D) 512
Answer : (C)

13 The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)?
A) 2
B) 3
C) 4
D) 6
Answer : (B)

14 Consider the following C function:
int f (int n)
{ static int i = 1;
if (n >= 5) return n;
n = n + i;
i ++;
return f (n);
}
The value returned by f(1) is

A) 5

B) 6
C) 7
D) 8
Answer : (C)

15 The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by
A) the instruction set architecture
B) page size
C) physical memory size
D) number of processes in memory
Answer : (D)