

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 $M \times N$ 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) $\lfloor a + b$
- B) $\lfloor \max \{a, b\}$
- C) $\lfloor \min \{M-a, N-b\}$
- D) $\lfloor \min \{a, b\}$

Answer : (A)

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

- A) name, courseNo \rightarrow grade
- B) rollNo, courseNo \rightarrow grade
- C) name \rightarrow rollNo
- D) rollNo \rightarrow 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 $m > 1$, $\hat{\epsilon} > 0$).

```
x = m;  
y = 1;  
while (x - y >  $\hat{\epsilon}$ )  
{ 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) $x \bmod y$ 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)