1) In booths algorithm if n is the no. of bits of 2 numbers x & y that are being multiplied 0 is initial value of register AC and $q_{(n+1)}$ respectively

2) Which algorithm allows us to multiply 2 signed binary integers in 2's complement - Booth's algorithm

3) What is the time complexity of karatsuba algorithm $O(n^2)$

4) Worst case complexity classice sieve algorithm $O(n^2)$

5) How do prove two numbers are co-prime $GCD(a, b) = 1$

6) If an optimal solution can be created for a problem by constructing an optimal solution for its subproblem the problem possesses optimal substructure property

7) Which of the following is not a stable sorting algorithm in its typical implementation - Quick sort

8) What is the meaning of an inplace sorting algorithm
- It needs $O(1)$ / $O(\log n)$ memory to create auxilliary location.

9) What is the solution of Josephus problem if n & k are 5 & 2 - 3

10) Consider a situation where swap operation is very costly which of the following sorting algorithm should be preferred so that no. of swap operation are minimized.
- selection sort

11) Which of the following tool is used to generate a API documentation in HTML format from doc comments in the source code - Java doc tools

12) What is the relationship b/w Java hashset and hashmap
- hashset internally implements hashmap

13)
```
if (M<=0)                    M = 10
 {
   if (M == 0)
   {
      Sop(",");
   }
   else
      Sop("2");
 }
Sop("3")
```

Ans: 3

14) Q: What does x perform

```
static void x (int n)
{
    if (n > 1)
        x (n/2);
    System.out.println (n % 2);
}
```

Ans: x performs conversion of integer to binary

15)

```
int i, j, k = 0;
for (i = n/2; i <= n; j = j * 2)
{
    for (j = 2; j <= n; j = j * 2)
    {
        k = k + n/2;
    }
}
```

Ans: $O(n \log n)$

16)

```
for (var i = 0; i < n; i++)
    i *= 2;
```

Ans: $O(\log n)$

17) Which of the following type casting is accepted in java

a) widening b) narrowing c) none of the above
d) both ✓

18) Which is the logical operator in Java converts with single operand - NOT (logical not)

19) Krukal algoritham uses vertex and prims uses edges to find MST.

20) public static void main (String [] args)
{
int x = -1;
Sop (x >>> 29); 7
Sop (x >>> 30); 3
Sop (x >>> 31); 1
}

21) Which of these is a type of streams in java
a) integer b) short
c) byte ✓ d) long

22) ASCII occupies first 0 to 127 in unicode character set used for characters in java.

23) What is the range of short datatype -32768 to 32767

24) Java is a platform independent language

25) what does '\u0021' refered as in Java
unicode escape sequence

26) JDK is used to compile, execute and debug java program.

27) int arr[i][j] =

1	1	1	0	0	0
0	1	0	0	0	0
1	1	1	0	0	0
0	0	2	1	1	0
0	0	0	2	0	0
0	0	1	2	4	0

Q: Hourglass sum

Ans: 13

28) array arr[] = {65, 32, 53, 16, 17, 44, 33, 66, 22}

Ans: 22, 66

29) what is the Kadane's algorithm
(To find the subsequence of an array with the largest sum)

30) Boyer moorei voting algorithm is used to solve which problem
- To find the majority element in an array.

31) What is recurrence for worst case for quick sort algorithm.
Ans: $T(n) = T(n-1) + O(n)$

32) given an integer a = 64, find the longest sequence of 1s after flip of bit in a's binary represents
Ans: 2

33) X is a binary no. of 8 bits, write the code to swap the 2 nibbles of integer x

Ans: x & 0x0F << 4 |

34) According to Euclid algorithm we keep on subtracting the smaller no. from larger no. repeatedly to obtain HCF

35) In karatsuba multiplication of 12345 * 6789 only one of the below choice represents the sub-problem of the solution.

Ans: 12 x 6

36) Which of the following is not a valid flow control statement in java

1) exit ✓ 2) break 3) continue 4) return

37)

Topics

1) Euler's totient's function
2) Strobogrammatic number
3) Sieve algorithm
4) Manacher's algorithm
5) ~~Josephus~~ Josephus algorithm
6)