Bharati Padhy, Gate 2020, GS-624, AIR-1531, Jest (2020) AIR-75

Some memory based questions:

IIT INDORE MS INTERVIEW QUESTIONS (2020)

1. Brief intro
2. DSA which area?
3. Define complete binary tree?
4. Heap data structure explain?
5. In heap sort - how many times you do build heap?
6. Heapify - with complexity?
7. Build heap complexity?
8. Definition of graph and tree?
9. Definition of forest?
10. Minimum number of trees require to make a forest?
11. Difference between malloc and calloc?
12. Null and void in C, can we compare them?
13. In an array complexity to find an element which is neither min nor maximum?
14. Complexity to find 2 such elements which are neither min or max.
15. Complexity to find a min element from an array.
16. Applications of stack?
17. Recurrence relation of linear search, Merge sort, Binary search with complexities.
18. 16.Explain theta(n) in merge sort?
19. Prove cos^2theta+sin^2theta=1
20. Qsn on pigeon hole principal
21. What is conditional probability?
22. Bayes theorem?

IIIT Bangalore MS Written Exam (2020):

1. R1 and R2 are equivalence relation then which of the following is true?
   - **a)** R1 U R2 is equivalence
   - **b)** R1 Intersect R2 is not equivalence
   - **c)** R1 Intersect R2 is not transitive
   - **d)** None of the above

2. C(n,k) means choosing k numbers from n numbers. Write the recurrence relation for this:
   - a) C(n,k) = C(n-1,k-1) + C(n-1,k)
   - b) C(n,k) = C(n-1,k-1) + C(n-1,k)
   - c) C(n,k) = C(n-1.k) + C(n,k-1)
   - d) C(n,k) = C(n,k-1) + C(n-1,k)

3. NXN grid which has n^2 cells, you have to travel from bottom left corner to the top right corner. You can take only up and right path. How many such path possible?
   - a) (2n)!/n!n!
   - b) n^2

c) C(2n,n)
d) n(n-1)/2

4. There are n guests in a party. Each and every person in the party will handshake with each other exactly once. How many distinct handshakes possible. Recurrence relation?
   a) T(n) = T(n-1) +1
   b) T(n) = 2T(n-1)
   c) T(n) = T(n-1) + T(n-2)
   d) T(n) = T(n-1) + n-1

5. Number of relations which are reflexive and symmetric both.
   a) 2^C(n,2)
   b) 2^P(n,2)
   c) 2^((n^2+n)/2)
   d) 2^n

6. While(1)
   {
   int *I = (int *) malloc (sizeof(int));
   }
   Printf("Hello world");
   a) Hello world
   b) Segmentation fault
   c) Infinite loop
   d) Stack overflow

7. There is a polynomial time function which calls constant times some other functions which also take polynomial time what is the total complexity?
   a) Polynomial
   b) Exponential
   c) Super exponential
   d) None

8. NP problem is best known as
   a) It is decidable in polynomial time
   b) It is verifiable in polynomial time
   c) It have an algorithm of exponential time
   d) It does not have any algorithm

9. There is a polynomial with highest degree 2.
   X 1 2 3 4
   F(x) 3 ? 13 21
   Find value of f(2)
   a) _____
   b) 25/3
   c) _____

d) None

10. Find the remainder of 7^222 mod 11
    a) 7
    b) 5
    c) 2
    d) 0

11. What is the size of page table if CPU generates 32 bit address, page size is 4KB and PTE size is 4 Byte.
    a) 8MB
    b) 2MB
    c) 4MB
    d) ___

12. You have m resources ,n process competing for them each having j number of resources requirement(consider all m,n and j are positive). Find the proper inequality which MUST ensure freedom from deadlock
    a) M=n+j+1
    b) (m-1)>= n(j-1)
    c) _____
    d) _____

13. Which of the following is/are true
    a) L1 cache is generally faster than L 2 cache
    b) L1 cache is generally smaller than L2 cache
    c) L2 is generally faster than middleware
    d) RAM is faster than L1 cache

14. Which of the following is/are false
    a) Preemptive schedule means longer delay for the shorter processes.
    b) Round robin scheduling follows FIFO
    c) In SJF we need prior knowledge of process running time
    d) SRTF is a non-preemptive version of SJF

15. Which of the following is/are true
    a) There is no polynomial time algorithm to find the graph is Euler is not
    b) There is a polynomial time algorithm to find the graph is Hamiltonian
    c) Dijsktra's all pair shortest path algorithm will not work properly when there is a negative edge.
    d) None of the above

IIT DHARWAD MS INTERVIEW (2020)

1. How many Prime numbers are there in universe?

2. How will you prove that there are infinite prime numbers?

3. You have given an empty stack which can hold atmost 3 elements, what will be the top of stack after following operations:
   Push 6,
   Push 4,
   Push 1,
   Push 5,
   Pop
   Pop

4. n=10
   Fun(n)
   {
   While(n>0)
   {
   Printf(n);
   Fun(n-1);
   }
   }

5. How many maximum regions will be there when we draw 19 lines on the plane?
6. You have a binary tree with n1 vertices of degree1, n2 vertices of degree 2, n3 vertices of degree 3. Explain n3 in terms of n1 or n2.
7. do
   {
   Sum=0,i=0;
   I++;
   Sum+=i;
   }while(i<5)
   Printf(sum);

IIT JAMMU Mtech Data Science Interview Questions (2020)

1. Yourself
2. Why Data Science?
3. If you have n numbers how many bits are required to present that numbers?
4. If you have a matrix of 3X3 which is not invertible then what you will say about the Rank of that matrix.
5. How many probability distribution function are there which you know?
6. Explain Binomial distribution? Mean and variance?
7. In which distribution Mean and variance are same?
8. You have given a number; you have to find the number of digits which are divisible by 3. Eg. If number is 123 then it should return 1 as output as only 3 is divisible by 3.
9. What is the complexity to find a number from BST.
10. You have a bidirectional graph max number of edges in that graph?
11. You have 2 events A and B. P(A)=0.6 P(B)=0.7 what you can say about it disjoint event or dependent? Axioms of probability.
12. There is a person A, who has 2 kids. If the first child is girl then what is the probability that 2^{nd} child is also girl.

IIT JODHPUR Mtech Interview Questions (2020)

1. Yourself
2. Write a program to find the 2^{nd} minimum number from an array in one pass.
3. CMMI Levels
4. Difference between Production environment and Deployment Environment.
5. You have given some ingredients and you have to make a recipe out of it. Using graph theory terms explain this scenario how you will do it.
6. If a matrix is invertible then what can you say about it. How to take inverse of a matrix.

IIT Gandhinagar Interview Questions Not mine(2020)

1. Time complexity to find the maximum element in the min heap and explain the method?
2. Given an array of length n and a number x find out two such elements in the array such that their sum is equal to the number x.
3. Given an array of length n, find two numbers such that their sum is equal to the rest of n-2 elements if there exist such case?
4. Two linked lists are given and due to programming error end node of first linked list is now pointing to some node of second linked list, how will you find that node? and you don't know which one is 1st linked list and which one is 2nd. The data values are not distinct.
5. Define joint probability in terms of conditional probability?
6. How will you find a cycle in a directed graph? some questions on forward edge and back edge.
7. Sort an array of n elements with k distinct elements optimally. How will you find the distinct elements in the array optimally?
8. A n*n matrix is given such that Aij = Aji, what will be the rank of this matrix?
9. How many different values a random variable can take with zero variance and why?
10. Prove that a directed acyclic graph has atleast one vertex with zero indegree.
11. Various ways to solve subset sum . Variations of the same problem.
12. Algorithm to get maximally connected graph having two components.
13. Suppose we have A*B . If we know determinant of A is 1. What can we tell about Rank of A*B in terms of B.
14. Give O(klogk) algorithm for finding k minimum element.
15. Prove two vertices of a graph have same degree.