IIT Bombay MS by Research CSE Dept Written Test + Interview

Written Test (Cleared)

Date May 2, 2022, 9 am to 12 pm

3 hours subjective test each que 10 marks 120 marks paper

3 streams we have to chose one stream beforehand.

      1) Intelligent systems (3 panels)

      2)Computing systems (3panels) (My preference)

      3) Theory (2 panels)

Total 12 questions to be solved from only one selected stream. Each panel of each stream min 8 questions.

1) Token1 a   token2   a(b+cd)*b   token3 a(b+cd)*cd

Find minimum DFA with tokens as their final states?

. abbadbacdabbcdbb   is this string can be parsed/detected by scanner or not? why?

2) question on paging do address translation page table given page size given

Int z;

Int recur(int x)

{

      Int y=1;

      If(x<=30)

      {

            x=x+z;

            y=recur(x-y);

            z=x*5;

      }

      Return z;

}

Main()

{

     W=1,z=15;

     z=recur(z-w);

     print(z);

}

Find output explain global/local variables, parameters passings, activation records and temporary results too.

4) Programming language scope resolution questions

5) you will given h,w return h*w matrix with following patterns given in example

Let h=4,w=6

* * * * * *

* + * + * +

* * * * * *

* + * + * +

6)

int gcd(int x,int y)

{

     Int init;

     If(x<y)

     Else

         Init=y;

     Int g;

     For(g=init; --------------;g--)

     {

         If(------------ and ------------)

            --------------------;

```
        }
        Return ------------
        }
```

Fill the blanks.

6) page size page table give VA convert to phys address

7) how much RTT for window size to reach 1MB from 1KB?

8)sender window size in stop-n-wait protocol numerical?

9)25 host required, address given, find no.of subnets formed ?

Hamming distance id can detect d-1 erros can correct (d-1)/2 numerical?

10)Blockchain question

11) CN throughput efficiency numerical?

12) two Binary search tree given, insert elements one by one, find leftmost of tree1 and rightmost of tree2?   Heapsort time complexity? Average comparison for searching in linked list of k elemments?

13) partition algo given and an array is given find the output of code on array after execution?

14) find output for n=8;

Int rec(int n)

{

        If(n!=0)

                Return n-rec(n-1);

        Return n;

}

 15) logic question quantifiers true false, combinatorics question

Result Declared on 5th May Morning

Result: Cleared Test Selected for Interview

Interview

Interview scheduled on 7th May 9:40 am to 10:20 am (Approx 40 minutes)

Questions:

1) which subjects you are comfortable with?

  (I said OS and Data Structure)

2) what are some scheduling algorithms you have worked on?

  FCFS, SJF, Round Robin

3) in SJF how do you know the execution time of processes beforehand? (You predict with aging algo or based on type of process)

4) Explain round robin? Which one is used in current operating systems? How do I decide what time quantum to take? When the processes get preempted in round robin explain with queue operations?

5) what is ternary tree? If given number of nodes what s height? (I generalized and explained for k arry tree too)

6) draw a tree. M is No. of nodes having two children and n is No. of node having 1 child. Find no. of leaves on tree.

7) can groups be finite and infinite? (Yes) give example of infinite and then of finite? is multiplication modulo 5 over set {0,1,2,3,4} is group or not?

8) what is virtual memory, demand paging?

How does paging works, address translation works, virtual add to phy address, page table etc

9) in demand paging how do search pages in secondary memory?

10) also how do you bring pages from secondary memory into main memory?

11) page table is stored in MM, how do you access it for paging?

(These 8-11 Operating system question were very brutal, he never looked like convinced or happy, always interrupting me in between and misunderstood that I was a something Instrumentation branch or so student and not a CSE student)

12) Product of an array is product of all its elements ex arr= {1,2,3}, product =6.

An empty array of n element is given, and a number k is given. Find max possible product of array by distributing k to n elements?

Like this statement:

We are given two numbers, n and k. We must find n numbers such that

$x_1 + x_2 + \cdots + x_n = k x_1 + x_2 + \cdots + x_n = k$

$x_1 * x_2 * ..... * x_n = maximum$

What are the values of $x_1, x_2, ... x_n$ if these numbers can be any real number ?

What are the values of $x_1, x_2 ... x_n$ if these numbers have to be non-negative numbers ?

(I didn't actually answer this question cause while I was thinking they dropped it due to time constraint plus I assumed k as integer which they didn't tell initially, their mistake I guess, so I only try telling base cases assuming k integer.

13) You graduated in 2021, what were you doing since then?

(I said I had placement offers from two service-based companies, but I rejected them as I wanted to go for higher education and that too from IITs hance I dedicatedly prepared for GATE exam only and nothing else)

13) do you have any questions? (I asked what qualities you were looking from a candidate)

14) you applied to CMInDS and CTARA too. If you get CMInDS/CATARA and CSE which, do you prefer and why?

Result Selected for final offer in round 3 of COAP 3rd June 2022

Result Day:

Since they were declaring offers from COAP round 1 itself and didn't get this in round 1 and 2, Lost all hopes and was not expecting this in 3rd round. Day before round 3 I was hoping to get some new IIT like mandi or jodhpur.

3rd June morning I checked COAP I was surprised and so happy but doubtful too. I had 4 offers Mandi, Goa, Patna and Bombay. I checked twice thrice, checked from another browser, checked if it is my login only or not etc.

Then I went to my mother and said, "Guess which college I got in 3rd round today?" she said IIT Powai (she knows it by Powai name and was very optimistic from the beginning).

So, I told her I got Mandi, Goa, Patna only. And she said, "you will get Powai in 4th round then, but you will definitely get it".

Then I gathered everyone in kitchen, my father, and brother, and then announced I got IIT Bombay, that too in CSE Dept. everyone was very happy. We waited for mail from IITB for provisional offer letter till 11 am. After that we told our relatives and put it on the WhatsApp story.

This one is the happiest day in my life.

Also, after 5 days I got offer from IIT Delhi MSR CSE too. Cherry on cake.