

**Sony India Software Centre Private limited**

**Written Exam pattern???????**

**Impetus Technologies**

**Written Exam????**

## **sigmoid question paper**

**Q1. Write a program to reverse the words in a string**

**5 points**

**For example :**

**Input: my name is hello**

**Output: hello is name my**

**Note:**

**Write Only the Functions & return the output.**

**Do not write main or input/output handlers.**

**Q2. You've got someone working for you for seven days and a gold bar to pay them. You must pay the worker for their work at the end of every day. If you are only allowed to make two breaks in the gold bar, how do you pay your worker? (Assuming equal amount of work is done during each day thus requiring equal amount (1/7 gold brick) of pay for each day)**

**5 points**

**Q3a. Write the code to evaluate if a given string is a palindrome.**

**5**

**points**

**Input: abcd**

**Output: 0**

**Input: aba**

Output 1

Input: a

Output 1

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Q3b. Write the code to find the minimum number of characters to be appended to a word to make it a palindrome**

**20 points**

Example:

Input: abba

Output: 0

Input: abb

Output: 1

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Q4. Write the code to find character with second highest frequency in a given string**

10

points

For ex:

Input: aaabbc

Output: b

Input: abcdddcaa

Output: c

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Q5. Create the data structure for a binary search tree. Write a function to evaluate if a given binary tree is a valid binary search tree.** 20 points

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Q6a. Function to evaluate a mathematical expression that has only integers, operators (+, \*) and numbers.** 15 points

Input:  $1*2+3$

Output: 6

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Q6b. Extend the function from Q6 to evaluate a mathematical expression that has brackets, integers, operators (+, \*) and numbers.** 20 points

Input:  $(1+2)*3$

Output: 9

Note:

Write Only the Functions & return the output.

Do not write main or input/output handlers.

**Has capital dynamics given offer letters at any IIT after GD & interview or they gave just an assignment (like at IITD) ?**

**IITD OR IITB GUYS PLZ UPDATE  
INFORMATICA INTERVIEW QUESTIONS ASAP**

ANY IDEA ABOUT RIL AND ITS TEST OR INTERVIEW?  
same question as nit warangal

**guwahati guys**

30 apti. questions and 60 Technical chemical multiple choice questions in 60 minutes.  
You will have to clear the aptitude round to be considered for the interview selection.

**capillary questions plz??**

Coding round :  
Sudoku puzzle. To check whether it is correct or not.

**Saavn Written**

**Guys plzz share eBay interview questions asap ???**

ERICSSON -Question Paper any idea??

5 sections for each question +1 or -1 , 75 bits 60 mins

english 15

reasoning 15

quant 15

technical 15

programing 15

there is separate papers for ECE and CSE

what type of technical ques ???

Moojic -Question Paper any idea?? They have changed the process !!

NetApp, Symantec held anywhere???????? Plz update the questions

Any hp written test questions ??

hfORACLE

**Any update on TEXAS INSTRUMENTS written test ???**

Its on Analog Design

**PLEASE update SYOPSYS questions....**

**Vmware Interview feedback?please..**

**VM Ware interview IIT KGP**

**Asked OS questions**

**1. Communication b/w threads**

**2. Heap memory related**

**Java ques**

**1. Annotation**

**2. Method overloading**

**3. inheritance**

**Data structure:**

**1. Common ancestors to two given nodes of tree**

**2. find top 5 elements of 1000 element**

**3. Queue using stack**

**4. merge sort**

**5. Longest increasing subsequence - Dynamic Programming**

**6. Frequency count of all words present in file**

**7. Zig-zag traversal of tree**

**Ques about my project**

**Any Update about CISCO written test?**

**Any Update from iitm Regarding**

**Written TEST ? pleasefcisco**

**IIT G: Easy test conducted by cocubes total of 60 questions in 60 min.. Cut off was a round 50-52**

**3 sections...1. English 2. mathematical abilities 3. Quant**

**Samsung Interview Questions Please - Reply here**

**LinkedIn interview feedback @ IIT Madras**

1. Design question. What interesting and useful feature would you add to LinkedIn website, which is not yet present in the website.
2. Convert Roman number string to integers. Convert decimal integers to roman number strings.
3. Compute all multiples of a number.
4. Paint the houses such that neighbouring houses do not have same color paints. Each paint has an associated cost. Paint all houses such that cost is minimum.
5. Compute number of BSTs that can be formed with 1 to n keys.
6. Given an array of integers, compute another array which contains product of all elements except ith element from input array, without using division operation.
7. Implement hash tables.
8. Given a stream of characters (stream is increasing char by char), check if newly formed 10-character word is present in already parsed/scanned stream. Print such repeating streams lexicographically at the end.
9. Questions on project, internships.

**Guys Please update questions form IIT Roorkee ??Please  
please please please..**

## **ABCO Advisory Board**

90 minutes pen and paper test

- 2 coding questions
  - 1)Next higher number with same number of set bits  
<http://www.geeksforgeeks.org/next-higher-number-with-same-number-of-set-bits/>
  - 2)print binary tree from top to down and bottom up manner (Vertical zigzag).  
mcqs, based on simple mathematics, algos ,os,networks .

## 25 questions + 1 programming question

Question type: 1-2 objective type, rest of the questions didn't have any options! Had to write the answer in the space provided.

Lots of C concepts tested. "Give output of program" type questions.

### IIT Kharagpur:

#### Q1. PROGRAMMING QUESTION

Given a number as a string/integer array, write a function to find the number of contiguous sub-sequences of the array which recursively add up to 9.

[http://locklessinc.com/articles/binary\\_search/](http://locklessinc.com/articles/binary_search/)

eg: 4189 => must return 3 as there are 3 subsequences = {18,189,9}

Recursive addition:

18 => 1 + 8 => 9

189 => 1+8+9 => 18 => 1+8 => 9

9

Main logic: all numbers which recursively add up to 9 will be divisible by 9. Then find sum of all possible contiguous sequences and check %9.

$O(n^2)$

There can be better solutions. This is what I could get.

Q2. An element is a Leader if it is greater than all the elements to the right of it. How many iterations need to be done to determine all the leader elements in an array.

Ans:  $O(n)$

Q3. Normal code of binary search given. This code cause arithmetic overflow in certain cases. Rectify that line with a fix.cap

Answer:

Issue happens in this line:

$m = (low + high) / 2;$

Fix:

$m = \text{low} + (\text{high} - \text{low})/2;$

Although not completely

For knowledge refer this:

Q4. In the following sequence a,b,b,c,c,c,d,d,d,d,... Find the 288th element.

Ans: x

Q5. A 2-d array of size  $n \times n$  is given with the following property:  
all rows and columns are in ascending sorted order.

To find a given element k in the array, this procedure is given:

1. Start at top right element
2. For current element e
  1. if  $e = k$ 
    1. return true
  2. if  $k < \text{element } e$ 
    1. move to left, if possible. If array's left bound reached, quit.
  3. if  $k > \text{element } e$ 
    1. move to bottom, if possible. If array's bottom bound reached, quit.

What is the number of elements that are compared to k, in the worst case?

Ans:  $2n - 1$

Q6.

```
int main()
{
    float x=0.1;

    if( x == 0.1 )
        printf("IF");
```

```
else if( x == 0.1f )
    printf("ELSE IF");
else
    printf("ELSE");
}
```

What is the output of the following program?

Ans: ELSE IF

Q7.

```
int a;
int main()
{
    int b;
    ..
    ..
}
int c;
```

Which of the variables has longest scope?

Ans: a

Some other basic questions on linked lists and number of swaps in bubble sort etc.

---

5 questions on SQL - moderate difficulty level

concepts tested: Join, outer join, group by

SELECT ... .WHERE X LIKE '%ABC%'

Note: '%NUT%' matches with 'SCREW\_NUT' i.e. % can also take empty string.

---

4 questions on passage comprehension. (not english comprehension :D ) The given passage introduced basic formulae on linear regression and stuff. Mean, slope, intercept etc. Then the formulae where to be used to find solution for some basic questions.

I initially skipped this section. But when I did get time, I came back and found that atleast 2 qns in this section were very easy. Just basic mean and addition and stuff. Just use the given formulae and solve. Please do take your calculators with you! :)

### **Company McAfee :-**

#### **McAfee@IITB:**

Pen paper test is conducted by eLitmus. Total 4 sections with 20 questions in each section.

Quant, Reasoning, Verbal and Technical. (Very irritating test).

negative marks after your 25% wrong answers per section.

Technical did not have any negative marking.

Technical was simple questions. (2-3 questions about JAVA inheritance.)

### **Company FlexTrade :-@IITB**

#### **Pattern???**

#### **Code:**

**1. Write a function that returns a unique character from an array of characters if present**

**2. Write a function to reverse a linked list**

### **3. Write a function to return all possible ways that a sequence of positive numbers sums to N**

DOES Morgan Stanley filtering to second round based on round 1?? ... No, everyone has to give both rounds

#### **Company Morgan Stanley**

2 papers: (very long)Update weight matrices based on feedback, drop a packet which seen by all users.

Paper 1: quant + DS + OS (3 sections) : sectional cutoff

Paper 2: C/C++/Java (no coding)

#### **Company Intuit @IITM: (Some funny group activity was conducted)**

Five questions on coding(pen and paper test):

1) Write a program to guess a number correctly between 0-9999.

(They were not clear about the question. The system returns just 'Yes' or 'NO'). No info about the number being greater/lesser was told.

2) Some puzzle... dont remember ( 120 wire cable puzzle )

3) Dynamic programming (To count the number of possible paths in M X N grid)

4) To convert a number in words.(123,456,67) is one hundred and twenty three million , four hundred and fifty six thousand and sixty seven

5) There are some one million hashtags. U need to return the top 3 hashtags which occur frequently...

**please post the questions asked and pattern of the paper.....any IIT?????**

#### **Company POCKET GEMS**

#### **@IIT KGP**

there were two questions for 50 minutes. both of them were based on dynamic approach. first question was same as given in this link.

<http://www.careercup.com/question?id=15928678>

Although some questions of CISCO are updated but can someone update exact format and number of questions along with questions if one remembers?

**Please share some CISCO QUESTIONS IITM GUYS**

**Company CISCO:**

**Its an objective test with 20 in aptitude and 30 from micro-electronics and basic CSE no subjective coding questions**

**Was the below pattern same for every branch ( CSE and Electronics both )? Yes**

**If someone remembers exact questions, please update. But as far as I remember, there were**

**two aptitude questions on averages,  
three on ordering(A can come before B...),  
one heights and distances(pythagorean)  
one directions,**

**If 423 is multiplied by x and answer is 45569, and 55 are wrong digits, find the right product.**

**Answer please?????????35**

**What is a number that leaves remainder 3 when divided by 5, 6, 7, 8 but 0 when divided by 9**

**1683**

**Q. a goat is tied to a corner of u square, with 7m rope. find the area of grazing?**

**Someone please update tech part.**

**address of RST-6 in 8085**

→ no of binary trees possible with n nodes?

catalan no

**why is Avalanche diode preferred to PIN diode?**

**One question on flipflop**

**minimum number of NAND gates required in  $Y=A+AB'+AB'C$**

**Is it 2???????????**

**Q: What is Zener diode?**

**Company Capital Dynamics @IIT KGP:**

(1) whether two strings are anagram of each other or not ... irrespective of anything you do, surely 1 test case will fail ... god knows why :P (what if two strings are same?)

(2) ou do, surely 1 test case will fail ... again god knows why :P how many total 1's are there from 0 to n (n will be input). e.g. output will be 6 for n = 13 (1, 10, 11, 12, 13 ... so total six 1's are there) ... here also irrespective of y.

(3) exactly same as the below link: <http://www.geeksforgeeks.org/find-the-smallest-positive-number-missing-from-an-unsorted-array/>

**Input array for ques (3) will be of type char**

**Were there only 3 questions and what was the pattern and duration of the test?**

**Company Linkedin @IITKgp:**

**Time : 2 hrs.**

**@ 6am : 10/11/13 (6AM? Really? Yes :) )**

**1) There are n(from input) steps and given another input x i.e. you can climb 1,2,3....x steps at a time. How many of ways can you reach the top stair.**

For example, given n = 3, x = 4

you can go 1,1,1 or 1,2 or 2,1 or 0,3 etc. So, it's should be 4.

//Answers

Starelation ndard Recurrence  $F(n,x)= F(n-1,x)+F(n-2,x)+\dots+F(n-x,x)$

.Dynamic Prog. is applicable  
Check boundary condition carefully.

## 2) Given a undirected graph, find the diameter of the graph. (People messed up with input!)

<http://people.hofstra.edu/geotrans/eng/methods/diameter.html>

Diameter: path between 2 nodes having maximum length. ^^^^^

The diameter  $d$  of a graph is the maximum eccentricity of any vertex in the graph. That is,  $d$  it is the greatest distance between any pair of vertices or, alternatively,  $d = \max_{v \in V} \epsilon(v)$ . To find the diameter of a graph, first find the shortest path between each pair of vertices. The greatest length among all these paths is the diameter of the graph.

It's a  $O(V^3)$  solution. Does the question said that it was a general undirected graph or a general tree??????

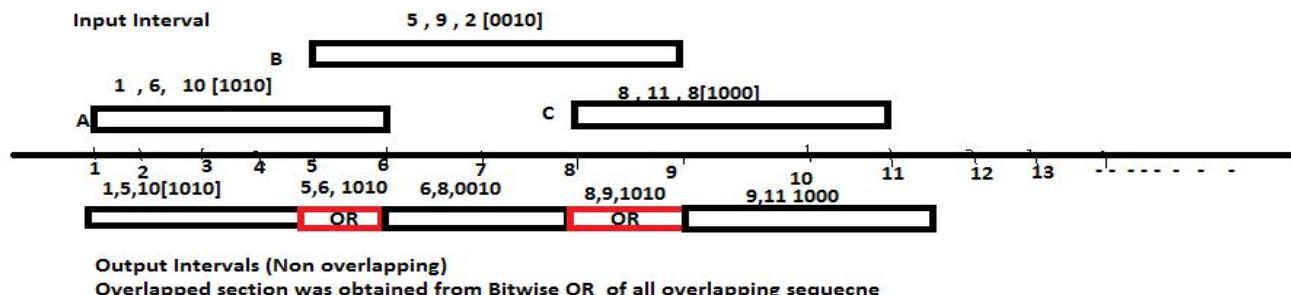
Please mention input size constraints and what was the input format??

**create all non overlapping intervals with range and value field**

3) Given a range ansd a signature 4-bit integer like this [21,30,1101b]. Here, the range is [21,30] and the four-bit integer is 13(1101b). Now, Given a range and a signature 4-bit integer like this

[1,10,4] and [2,5,3] = [1,2,4],[2,5,4-bitwise-or-3],[5,10,3]. So on ..!

(kindly explain what we need to code and result ?, seems question is not complete)



1,6  
5,9  
8,11

for above question you had to . Overlapping intervals can be obtained from taking bitwise OR operation of overlapping sequences. hope it explains this question  
I guess initially you had to ao of intervals as input then then sequentially read new each interval in a new line

What is the significance of signature if it was just about finding non-overlapping intervals? Why finding overlapped signature?

for particular interval input will be in this format

1 6 10 (All values will be in decimal , first two fields indicate Range and 3rd field indicates sequence or value )

Anyone has solution of this?????? (Solution: sort all end points of interval and print consecutive points as new non-overlapping intervals with computed significance)

IIT Delhi, Madras: same as above

@IITK

3 coding questions

Interview street platform

2 hours

Question 1

Given N find the number of triplets (a,b,c) of integers such that  $a^2+b^2+c^2=N$

$N \leq 50000000$

Ans: use 2 loops and range till  $\sqrt{n}$

Question 2

**Given two containers having n and m gallons initially find the minimum number of steps required to correctly measure l gallons.**

**Only allowed operations:**

- empty a container
- fill a container completely
- transfer contents of one into other completely or till the other

**container fills up.**

**output minimum number of steps to get l gallons. output -1 if can't be done.**

**Ans: use bfs**

### **Question 3**

**Given N 2-dimensional rectangles in the form of opposite corners find the total area covered by the rectangles.**

**Sides of rectangles are parallel to the axes. More than 2 rectangles can overlap each other. They can also overlap completely.**

### **Company inmobi @IITD-:**

There were about 20 MCQs (30 minutes) to be done after the coding section. MCQs were totally nonsense. Can be done in 10 mins.

For coding section 60 mins.

1. In a line where words are separated by spaces,  
, and capitalize first letter of the reversed word. Other letters of the word should be in small.  
Input : “how are you?” → Output: “Woh Era ?uoy”
2. The second question reduced to finding maximum weight matching in a bipartite graph. Not many people would have done this (maybe none).
3. There are 2 sets of countries. One set will donate clothes (something of this sort) and another

set will accept clothes. A country can be in only 1 of the sets. The amount of clothes donated is also given. The problem is to maximize this amount of clothes. Condition: One-to-One relationship must be there between countries in different sets. Test Cases are like this:

{4,4,5,{1,3,7},{1,2,6},{2,1,5},{3,4,6},{4,2,4}}

{r1,r2,tc,{c1,c2,a},....}

r1 = no. of countries in set1

r2 = no. of countries in set2

tc = no. of test-cases - followed by that no.of test-cases

{c1,c2,a} = c1 country is giving 'a' amount of clothes to c2 country. Maximize the total amount donated, following the condition that one country can donate to only one country and one country can accept from only one country.

### **IITR Coding Questions**

1. Same as in IITD
2. 0/1 Knapsack Problem. Weight was replaced by time.

### **Company Goldman Sachs @ IIT K**

#### **Solutions please**

Goldman sach written conducted at IIT Kanpur on 6 nov 2013

There was 2 test one is multiple choice objective of 75 min and other is subjective of 90 min

There are some questions

Test 1:there are 25 questions some of them are

❖ which of these are not the degree 3 sequence of a simple graph(solve by Havell Hakimi)

❖ if prob of occurring head is p then find the prob that hhhh comes before thhh

➤ ans  $(p^4 B^-)$  from

[https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CC4QFjAA&url=http%3A%2F%2Fwww.math.wisc.edu%2Fkiselev%2FHW04sol.doc&ei=Hwx\\_UqHVEM2prAf2yIDABA&usg=AFQjCNHMoCAZgNWwKInvWxM0b5itlA-n7A&sig2=5uaxXgXvue-GdhPzQPFKTA&bm=bv.56146854,d.bmk&cad=rja](https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CC4QFjAA&url=http%3A%2F%2Fwww.math.wisc.edu%2Fkiselev%2FHW04sol.doc&ei=Hwx_UqHVEM2prAf2yIDABA&usg=AFQjCNHMoCAZgNWwKInvWxM0b5itlA-n7A&sig2=5uaxXgXvue-GdhPzQPFKTA&bm=bv.56146854,d.bmk&cad=rja)

❖ a square of unit length has center at 0,0 and edge parallel to axis find the expected value  $\max(X, Y)$  here x,y is a point in the square

a square of unit length has center at 0,0 and edge parallel to axis find the expected value  $\max(X, Y)$  here x,y is a point in the square

solution : X and Y are independent and distributed uniformly in  $[a,b]$  , then

expectation of  $\max(X, Y) = E[\max(X, Y)] = (2*b^2 - a*b - a^2) / (3(b-a))$

in our problem  $a=-1/2$  and  $b=1/2$  so after calculating we get

$E[\max(X, Y)] = 1/6$

### ALTERNATE SOLUTION

for { (x,y) |  $x < y$  and  $-1/2 < x, y < 1/2$  }

expected value =  $2 * \int \int (y \, dx \, dy)$

for { (x,y) |  $x > y$  and  $-1/2 < x, y < 1/2$  }

expected value =  $2 * \int \int x \, dx \, dy$

putting the appropriate limits you'll get  $1/6$

❖ one ques to check conflict serializability

❖ 2 radioactive balls among 15 balls find the min no. of test that can be done to find the radioactive balls, test can be done on group or individual balls

❖ ans 7

Ans <http://math.stackexchange.com/questions/43696/how-to-find-the-balls>

- ❖ Sara has 6 flower pots, each having a unique flower. Pots are arranged in a row. Sara rearrange the sequence each day but not two pots should be arranged adjacent to each other which were already adjacent to each other in previous arrangements. How many days she can do this or how many such arrangements is possible ? ans 3 B-|

Ans <http://math.stackexchange.com/questions/560726/flower-pot-puzzle>

- ❖ In one island there are 3 colors of chameleon , 10 blue , 15 green and 14 red (i think these are the numbers) . when two different color's chameleon meet together , they convert into the third color. minimum no. of meeting required to convert all chameleon into same color? ans 14 B-|

<http://gurmeet.net/puzzles/chameleons/>

I think it is not possible because-

any step changes the difference between the number of chameleons of any pair of colors by 3 or 0.

since none of these differences are initially a multiple of 3 therefore no sequence of meetings can lead to a condition where all chameleons have the same color. since between the number of chameleons of any pair of colors by 3 or 0.

since none of these differences are initially a multiple of 3 therefore no sequence of meetings can lead to a condition where all chameleons have the same color.

*Correct me if i'm wrong.*

*whats wrong in this first 10 meeting between blue and red will give 25 green(35 green and not 25) and 4 red. then 2 red and 2 green will meet to give 2 blue . then finally 2 red and 2 blue will give 25 green..... 14 meetings*

*The mistake here is that 2 red and 2 green will give 4 blue not 2 blue and first iteration will give 35 green not 25.*

*solution:*

*reference:<http://tierneylab.blogs.nytimes.com/2009/09/21/monday-puzzle-darwins-spirit-restores-parity/>*

1. Let us say that the number of red, green and blue eggs are  $r$ ,  $b$  and  $g$ . These numbers can be even or odd. Since there are three of them two must have the same parity, that is, at least we have a pair of odd numbers or a pair of even numbers. The average of two odd or two even numbers is a whole number.

2. Denote the number of red, blue and green chameleons  $r$ ,  $b$  and  $g$  respectively. The criterion to know if the a given set of chameleons can all change to one color is the following: a given terrarium can not be unicolored if  $r+b+g$  is a multiple of 3, and  $r+2b$  is not divisible by 3. Stated as this it seems asymmetrical in  $r$ ,  $g$  and  $b$ , but in fact is not (simple arithmetic). 1414

In the following we denote the remainder of the division by 3 like this  $a = b \pmod{3}$  means that the remainder of the division of  $a$  by 3 is  $b$ . For example,  $5 = 2 \pmod{3}$ , means that the remainder of the division of 5 by 3 is 2.

To understand why the criterion is true, we have to consider several cases. Since the remainder of the division of any number by 3 can be 0, 1 or 2, we analyze one case at a time. One crucial observation is: the remainder of the division of  $r+2b$  by 3 is not changed after meetings between chameleons. This is so for the following reason: denote the possible meeting by (rb), (rg) and (bg). Then:

after (rb):  $(r,b,g) \rightarrow (r-1,b-1,g+2)$ , then  $r+2b \rightarrow r-1+2b-2 = r+2b-3 = r+2b \pmod{3}$

after (rg):  $(r,b,g) \rightarrow (r-1,b+2,g-1)$ , then  $r+2b \rightarrow r-1+2b+4 = r+2b+3 = r+2b \pmod{3}$

after (bg):  $(r,b,g) \rightarrow (r+2,b-1,g-1)$ , then  $r+2b \rightarrow r+2+2b-2 = r+2b = r+2b \pmod{3}$

Therefore the remainder after division by 3 (which we will call it “trinity” for obvious reasons...) is invariant.

Now, let us see case by case. Each case in  $r+2b = a \pmod{3}$ ,  $a = 0, 1, 2$ , has to be split in subcases for the remainders of the sum  $r+b+g$ . For example, for the case  $r+2b = 1 \pmod{3}$  we have to study  $r+b+g = 0, 1, 2 \pmod{3}$ . This covers all possibilities.

a)  $r+2b = 0 \pmod{3}$ .

In this case unicoloring may happen. To see how, suppose  $r < b$ . Note that  $r+2b = 0 \pmod{3}$  implies  $b-r = 0 \pmod{3}$ . Then we can do the following sequence of meetings: after  $r$  meetings between  $r$  and  $b$  chameleons we have:  $(r,b,g) \rightarrow (0,b-r,g+2r)$ . Now we do the following “tango”: a blue and a green chameleon meet, then we have two meetings between red and blue chameleons, which implies that:  $(0,b-r,g+2r) \rightarrow (2,b-r-1,g+2r-1) \rightarrow (0,b-r-3,g+2r+3)$ . We can repeat  $n$  times until  $b-r-3n = 0$ , leaving  $(0,0,r+b+g)$  (recall that  $b-r$  is divisible by 3). So, unicoloring may happen.

b)  $r+2b = 1$  (3)

b1)  $r+b+g = 0$  (3)

If we manage to unicolor the chameleons, then we must have  $(r,b,g) \rightarrow (n,0,0)$  or  $(0,n,0)$  or  $(0,0,n)$ , and each case has  $r+2b = 0$  (3), which is a contradiction, since the trinity is invariant and initially it was 1. So unicoloring can not happen.

b2)  $r+b+g = 1$  (3)

Since  $r+2b = 1$  (3) and  $r+b+g = 1$  (3) we have  $r+2b - b+g = 1$  (3)  $\rightarrow g-b = 0$  (3). But according to a), unicoloring may happen. (this is so, because  $g-b=0$  (3) implies  $b+2g = 0$  (3), which is the same as case a)).

b3)  $r+b+g = 2$  (3)

In this case  $r+b+g + r+2b = 1+2$  (3)  $\rightarrow g + 2r = 0$  (3). Again, by case a), unicoloring may happen.

c)  $r+2b = 2$  (3)

c1)  $r+b+g = 0$  (3)

By the same argument in b1), unicoloring is not possible.

c2)  $r+b+g = 1$  (3)

Then  $r+2b + r+ b+ g = 2+1$  (3)  $\rightarrow g+2r = 0$  (3), and by a) unicoloring may happen.

c3)  $r+b+g = 2$  (3)

Then  $r+2b+r+b+g = 2 + 2$  (3)  $\rightarrow g + 2r = 0$  (3), and by a) unicoloring may happen.

Conclusion: to avoid unicoloring we need to have  $r+b+g=0$  (3) and  $r+2b = 1$  or  $2$  (3).

- ❖ what is the minimum no. of comparisons required to find the second largest no. in an array of size N
- ❖  $(N+\text{ceil}(\log N) - 2)$  (repeated???) )

answer(<http://stackoverflow.com/questions/3628718/find-the-2nd-largest-element-in-an-array-with-minimum-of-comparisom>)

## test 2: Subjective Questions

1. If a network has a maximum packet data size of 128 bytes, a maximum packet time-to-live of 30 seconds and an 8 bit sequence number, what is the maximum data rate per connection for this network?

**2. design an algo to find the no. of ancestors of a given node with i) O(m) memory , ii)unlimited memory size.**

**what is 'm' here? is it the number of nodes?**

**3. in an undirected graph 2 people play a game that if one chose any vertex then second must choose its adjacent vertex prove that 2 will win only if there is perfect matching otherwise 1 wins always.**

**Solution : 3.1.18 west book solution manual for graph theory**

**4. *Prove* or disprove that the no of edges in eulerian bipartite graph are always even.**

**solution :**

<http://answers.yahoo.com/question/index?qid=20130227220918AAoWQvp>

**Every vertex has even degree. We can count the edges by summing the degrees of the vertices in one partite set; this counts every edge exactly once. Since the summands are all even, the total is also even.**

**5. in binary no we can find that the no. is even or odd only by checking its 1st digit is it can be done with other base and why?**

**solution : disprove as for (10) in base 3 = 3. Here first digit 0 is even but the number is odd.**

**IIT Bombay and IIT KGP and IIT Guwahati and IIT Delhi -**

**Objective**

**75 mins**

1. What is the minimum number of comparisons needed to find the maximum and the minimum numbers from an array of 100 numbers?

ans :148

2. Find the total number of solutions of equation  $xyz=72$ .

ans :60

$$72 = 2^3 * 3^2$$

so ans =  $5C3 * 4C3$  (Wrong)

Pls check this answer

$$72 = 2^3 * 3^2$$

Now if

$$x = 2^{x_1} \cdot 3^{x_2}$$

$$y = 2^{y_1} \cdot 3^{y_2}$$

$$z = 2^{z_1} \cdot 3^{z_2}$$

$$xyz = 2^{\{x_1+y_1+z_1\}} \cdot 3^{\{x_2+y_2+z_2\}}$$

Number of positive integral solns of  $x_1+y_1+z_1 = 3$  is  $(3+3-1)C3 = 10$

Number of positive integral solns of  $x_2+y_2+z_2 = 2$  is  $(3+2-1)C2 = 6$

Therefore total number of positive integral solns is  $10 * 6 = 60$ .

Now considering the negative integral solns. Final answer is positive for the following four sign combinations of x,y and z {++, +-, --, -+}

Overall number of integral solutions is  $4 * 60 = 240$ .

3. Find the total number of solutions of equation  $xyz=510510$  where  $x^2y+y^2z+z^2x=xy^2$

$$+yz^2+zx^2$$

Answer : 3

$$510510 = 2 \times 3 \times 5 \times 7 \times 11 \times 13 \times 17$$

$$x^2y+y^2z+z^2x=xy^2+yz^2+zx^2$$

so on factorization  $(x-y)(y-z)(z-x) = 0$ , two out of three must be equal, none of prime factor is having power two. So only solution will be  $(1,1,510510)$  and permutations.

4. A photon starts moving in random direction from the centre of square of size 3. Let's say it first colloids to the glass wall AB. What is the expected distance travelled by photon before hitting the wall AB again?

Answer- 6-8 (not 100% sure)

5. If a dice is thrown till the sum of the number appearing on top face of dice exceeds or equal to 100. What is the most likely sum?

Ans : 100

6. One question was related to grammar

E->T+E | T-E | T

T-> F\*T | F/T | F

F->a

Something like this. And a few statements were given like 1. The grammar is ambiguous 2. The grammar is left associative 3. Right associative 4. \* and / get precedence over + and -....bla bla blah. And it was asked to find which of the statements are correct. 1, 2 and 3, Only 1 and 2, Only 2 and 3,... something like that.

7) Time complexity of inversion operation

ans :  $O(N \log N)$

8) Egg drop puzzle 100 floors 2 eggs . minimum number of floors

ans : 14

9) The value of r for which area of triangle with two tangents and chord of contact is maximum. circle  $(x-1)^2 + (y-2)^2 = r^2$ . Tangents are drawn from (7,10)

ans :  $\sqrt{50}$

10)  $\lim_{n \rightarrow \infty} \frac{1^a + 2^a + \dots + n^a}{(n+1)^{a-1} [(na+1) + (na+2) + \dots + (na+n)]} = \frac{1}{60}$  . Find the value of a.

answer :  $a = -17/2$

**divide numerator and denominator by  $1/n^{(a+1)}$  and cauchy theorem**

11) A  $3 \times 3$  matrix  $M$  is given where  $M[i,j] = 1$  if there is a direct flight from airport  $i$  to airport  $j$ ; 0 otherwise. If 1, 0, -1 are eigen values of this matrix and  $M[2,3] = 1$ , find the number of ways in which airport 2 can be connected to airport 3 in 3 hops.

12) Find  $\text{val1}(78)$ .

```
int val1( int n )
{
    if(n==0) return 0;
    if(n==1) return 1;
    return 2+6*val2(n-1)+val1(n-2);
}
int val2(int n)
{
    if(n==0) return 0;
    if(n==1) return 1;
    return val2(n-2)+4*n;
}
ans : 78^3
```

13. primality of  $n^4 + 4^n$ , for  $n \geq 2$ .

**answer : composite**

**n = even , composite (obvious)**

**n:odd**

$$n^4 + 4^n = n^4 + 4^n + 2 \cdot 2^n \cdot n^2 - 2^{n+1} \cdot n^2 \quad (\text{this term is perfect square})$$

use  $(a+b)^2 - c^2 = (a+b+c)(a+b-c)$  so composite.

F

14. Determining whether  $x^y + y^x$  is  $\geq$  or  $\leq 1$  in given ranges.

**Solution:** (  $1/e - 1/e^2$  ,  $1/e$  )

14. layer 4 firewall properties. which of the following is false?

Ans. d) can block https

15 A number is stored in its binary form in a linked list in reverse order. For example, if 4 or  $(100)_2$  is stored as 0->0->1.

Find the time complexity of updating the variable x stored as above data structure if it is updated to floor of  $(x/8)$  in terms of n, where n is the size of the linked list.

## Subjective

**90 mins, but the questions were so difficult that junta from my hall started leaving in just 5 mins**

1. a) Two sets  $X=\{x_1, x_2, \dots, x_n\}$  and  $Y=\{y_1, y_2, \dots, y_n\}$  such that  $x_1 \leq x_2 \leq x_3 \leq \dots \leq x_n$  and  $y_1 \geq y_2 \geq y_3 \geq \dots \geq y_n$ . Let  $Z=\{z_1, z_2, \dots, z_n\}$  be any permutation of elements of Y. Then prove that

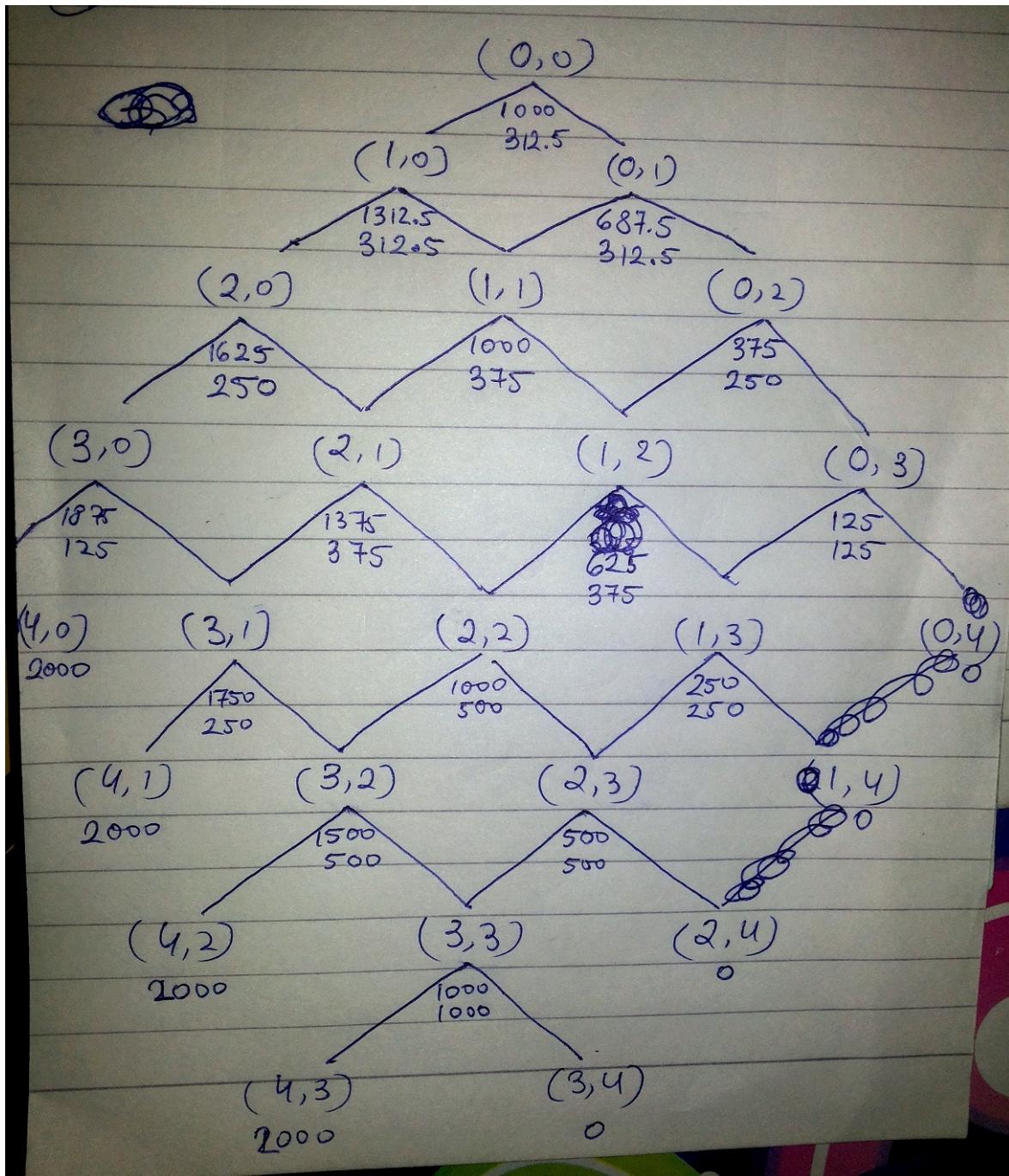
$$\sum_{i=1}^n (x_i - y_i)^2 \geq \sum_{i=1}^n (x_i - z_i)^2$$

b) As a corollary, for a sequence of positive numbers  $\{a_k\}$ , prove that

$$\sum_{i=1}^n \frac{a_k}{k^2} \geq \sum_{i=1}^n \frac{1}{k}$$

2. Betting on the World Series. You are a broker; your job is to accommodate your client's wishes without placing any of your personal capital at risk. Your client wishes to place an even \$1,000 bet on the outcome of the World Series, which is a baseball contest decided in favor of whichever of two teams first wins 4 games. That is, the client deposits his \$1,000 with you in advance of the series. At the end of the series he must receive from you either \$2,000 if his team wins, or nothing if his team loses. No market exists for bets on the entire world series. However, you can place even bets, in any amount, on each game individually. What is your strategy for placing bets on the individual games in order to achieve the cumulative result demanded by your client?

Ans:



3. Prove or disprove that Eulerian simple graph with even vertices contains even number of edges.

**Answer : Not true (there is a counter example)**

4. Two threads t1 and t2 print can 2 and 4 respectively. Write the code for t1, t2 using standard locking mechanism such that following series will be printed: 4 2 2 4 4 2 2 4 4 ....
5. GCD of ith to jth elements of array. There will be  $O(n)$  number of such queries.
6. N points are randomly and independently marked on a unit circle. The circle is cut at the points. Find the expected length of the arc containing the point (1,0).

(answer =  $2\pi/N$ ) (I doubt this answer is incorrect) ( This is correct :P )(no its not)

- \* if you assume that each cut point,  $x_i \sim U(0, 2\pi)$  on circumference, the answer is  $4\pi/n+1$
  - \* if you use symmetry, saying doesn't matter which point we choose for the arc, it's  $2\pi/n$
- incorrect**, you need more insight of random variables :P)

[http://www.math.northwestern.edu/~mlerma/problem\\_solving/putnam/training-probability](http://www.math.northwestern.edu/~mlerma/problem_solving/putnam/training-probability)

#### \* $4\pi/n+1$ is correct

**Explanation:** Think problem as  $N+1$  random point (include 1,0), because if you fix one point and take  $N$  random point ,is equivalent to take  $N+1$  random point(because there is no sense of absolute distance). Now arc containing 1,0 will be formed from two adjacent arc having mean length  $2\pi/n+1$ (all the arcs having equal mean of  $2\pi/n+1$ ). so mean length=  $2\pi/n+1 + 2\pi/n+1 = 4\pi/n+1$ .....

7. In a class of 9 students, each student sends a gift to 3 other students. Is it possible that all the students get gift back from each student to whom they sent the gift.

**Answer : No**

<http://cse.iitkgp.ac.in/~agupta/graph/Sol-H1.pdf>

#### 14 Problem 7

8. There are 4 resources of the same type and there are three processes each of which need atmost two resources to complete. Is this a deadlock situation? Why/Why not?

ans : Deadlock-free

9. There are 2 threads. One prints 4 and another prints 2. Give a synchronization mechanism such that the following is printed.

42244224...

10. You are given an array of numbers. You have to find the gcd of a range of numbers in the array. You will be given the start and end index i and j between which the gcd id to be found.

Ans. Use segment tree

Similar to <http://www.geeksforgeeks.org/segment-tree-set-1-sum-of-given-range/>

IITG :

**Paper 1 : 75 mins . MCQ. only one answer correct**

**Paper 2: 90 mins . Subjective**

**Subjective questions.**

1. Some Acquire Lock question. Dont remember.
2. 9 students. Each student sends cards to 3 other students. Will each student receive cards from the 3 students he has given cards? why?
3. for Eulerian graph Prove or disprove : that if vertices are even then there will be even number of edges.
4. Four resources. 3 processes. A process can take at most two resources . will there be a deadlock ? Why?
5. Some Matrix question. Dont remember. someone update if he remembers the question.
6. class a{

**public :**

```
~a()
{
    printf("destroy");
}
```

};

```
vector <a*>v1 =new vector<a*>;
vector <a> *v2=new vector<a>;
```

**Whose destructor function will be called?**

- (a) v1
- (b) v2
- (c) v1 and v2.
- (d)none

**7. There is shortest path between A and B. Let it be P. Now a link is broken between A and B along this shortest path P. let the point of breaking be u and v. Now 2 options exist:**

- (a) To follow the path P upto u and then follow another shortest path to v. and then continue the shorter path P. Let the time required for this be T1.
- (b) To find a new shortest path between A and B and not using path P. Let the time required for this be T2.

**Prove or disprove :  $T_1 \leq 3T_2$ .**

**8.  $X_1 \leq X_2 \leq \dots \leq X_n$ .  $Y_1 \geq Y_2 \geq \dots \geq Y_n$ . Let  $Z_i$  be any permutation of  $Y_i$ .**

**Prove that  $\sum (X_i - Y_i)^2 \geq \sum (X_i - Z_i)^2$**

**9. Print the sequence : 4,4,2,4,4,2,2,4....with the help of proper synchronization between two threads t1 and t2.**

**10. void printarray(int a[], int size)**

```
{  
    if (size==0)  
    {  
        // dont print anything  
    }  
    else if(size==1)  
    {  
        //print one element  
    }  
}
```

```

else
{
    //print all ten elements of array
}
}

```

and corresponding assembly code was given. ( You cant use greater than operator for comparison because such an operaor was not given in assembly code. only compare function was given.). What is teh problem in above code with respect to pipelinign when it is given that most of the instrudction have a size greater than one . Write such a code and write the corrsponding assembly code.

8. There is a variable i which is made by class A. Make variable in such a way that it is allocated on heap . Make a function for intilization and trasnferring of ownership . when the bariable is deleted an explicit function should be amde for that.

9. A square(made of mirror) given of side length : 3 cm . A photon hit a point A by starting from the center of the square . what is expected distance it covers before hitting at point A again.

- (a) [2,4)
- (b)(4,6],

10.A circle of radius one is given. N chords are made in circle. find expected length of chord of circle containing point (1,0).

11.  $\text{gcd}(a,b,c)=\text{gcd}(a,\text{gcd}(b,c))$

$\text{gcd } (a)=a;$

An array containing n elements with k bit of each number . given array is  $[a_1,a_2,...a_n]$ .  $q(=O(n))$  queries come which specify i and j for which we have to take out gcd of  $[a_i,a_{(i+1)},...,a_j]$ . Make an algorithm to analyse run time complexity and memory required.

## **Company Adobe:-**

<http://www.iitplacementpapers.com/2012/09/blog-post.html>

**IIT Delhi** : (same paper got repeated )

**IIT Roorkee:** Same as above

**IIT Guwahati:** Same as IIT Delhi. (time limit 2hrs )

**IIT Madras:** Same Paper

**IIT Kanpur:** Same Paper

## **Company Amazon @IITG:**

Amazon coding questions at IIT Guwahati

Amazon MCQs

- 1) Huffman code for a,b,c,d,e
- 2) Initially 5 numbers stored in max heap. level order given. 2 new number inserted . find new level order.
- 3) If  $P(a) = 1, P(b) = 1/2$  and  $P(c) = 1/3$  and a,b,c are independent, find  $P(a/b)P(b/c)P(c/a)$ . this question was repeated.
- 4) 3 men playing a game with coin, whoever gets first head wins. find the probability of winning of 3rd guy....
- 5) one code was there on tree. It was finding the height of tree.
- 6) 2 questions on recursion. cvf
- 7) 11 players team. age of captain=26 and wicketkeeper=29 given. avg age of team = avg age of team without captain and wicketkeeper +1, find the avg age of team
- 8) Arranging time complexities.
- 9) in insertion sort if we use binary search instead of internal loop, what would be the time complexity. Please Write answer if somebody know about it - Complexity won't improve because still n swaps will be required.

Explanation :

Can we bring down the complexity of insertion sort to  $(N \log N)$ ? Observe that the cards in left hand are always sorted. Can't we use binary search to efficiently locate final position of current inserting card in  $O(\log N)$  time? Perfectly, yes. But, we can't bring down the complexity to  $O(N \log N)$ . Because of the fact, even after finding final position of current inserting card, we need to move down those cards that are bigger than present card to one step past their current position, in order to make room for present inserting card.

### Company Amazon @ IITK

#### **Coding questions**

- 1) Check if given two strings are anagrams( ignore spaces and don't consider case sensitive cases)
- 2) given array of strings sensitive cases)
- 2) given array of strings of dates in dd/mm/yyyy form , write a program to sort them
- 3) given array of strings in dd/mm/yyyy form , write a program to sort them

**Only the algo was required or code was also asked ??Also the input was a 2D-character array or was it array of strings (It was array of strings).).**

**These are coding questions and implementation is required**

### Company Amazon @ IIT D : Marking +1/-0.25

1. one Probability, one reasoning, one java, one network question subnet mask question.
2. TOC question  $(a+b^*)$  and  $(a+b)^*$  same language or subset.
- 1) find in a array different number of pairs with difference k. Array has unique elements.
- 2) Second question was same as  
<http://www.geeksforgeeks.org/forums/topic/direct-i-coding-round-2/>  
only story was changed, test cases were same.

### **IIT Madras:, same in IIIT Roorkee**

For MCQ's go through last 5 years GATE papers  
coding:

1. List all the repeated characters lexicographically in a string(if 'a' & 'A' are there, that also

counts as a repetition.

2. print the 90 degree rotation of a matrix.

### IIT Guwahati:

Find the minimum distance between 2 numbers.

<http://www.geeksforgeeks.org/find-the-minimum-distance-between-two-numbers/>

Sum of 3 linked lists. for two list u can see.

<http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>

### IIT Bombay

20 MCQs : aptitude, data structures, os, C

1 Coin change problem: Given a “sum” and denominations of coins, find minimum number of coins required to make the “sum”.

2. Find anagram pairs in an array of strings. Check should be case insensitive.

### IIT Hyd:

1. First non-repetitive character in string.

2. Next higher number with same digits .

<http://stackoverflow.com/questions/2553522/interview-question-check-if-one-string-is-a-rotation-of-other-string>

### IIT Kgp

#### 90 min test

20 MCQ's. Basics, covered evrythng from OS,DBMS,Netwoking,C,OOP & DS.

2 codes:

1. Left view of binary tree

<http://www.geeksforgeeks.org/print-left-view-binary-tree/>

2. Given n points, find 3 nearest points from each

Input:

n (no of points)

then n lines each containing id,x,y

Output:

n lines each containing id of 3 nearest points

(The output for the sample test case was wrong, and so no one's answer matched. Complained about it... Lets c :))

The Amazon guy said they would check the solution manually.

Coding round Amazon:

Given a square matrix of size n containing positive integers. Find the greatest submatrix(square or otherwise) which is sorted both row-wise and column-wise in increasing order. A matrix is sorted row-wise, if all the elements in any row are sorted in increasing order. And similarly, a matrix is sorted column-wise, if all the elements in any column are sorted in increasing order. Greatest submatrix is defined as the submatrix containing the maximum number of elements.

eg

```
2 5 3 8 3
1 4 6 8 4
3 6 7 9 5
1 3 6 4 2
2 6 4 3 1
```

has the greatest submatrix as

1 4 6 8

3 6 7 9

**Company Cisco @IITB:**

IITB - 09 Nov

20 Apti + 30 Technical MCQs (1 hr)

Questions on Digital Logic, 1 ques on Zener diode

1 Question on networking, 1 Question on np transistor

You have four balls two red and two white which you need to keep into two boxes. Out of these two boxes, your wife will randomly pick (one box and then) one ball. If she picks a red ball, you win a prize. With best possible strategy, what is the probability with which you will win the prize?

**ans 5/6 (Please explain, I am getting 4/6)**

Two straightforward questions on venn diagram.

**A cylinder of height 105 cm has a circumference of 20 cm. A string makes exactly 7 complete turns round the cylinder while its two ends touch the cylinder's top and bottom. How long is the string?**

Q. Which of the topology have to do with multiple connected nodes with a single physical line?  
a. star b. bus

**@nitw :: same as above + following ...**

-reset lower bit using 8085 instruction Ans - A

NI 0F;///its awz[/'//fvt ni f0

-refer 8085 instruction

-simple digital questions (refer K maps) 2-3 questions

-prefix/postfix Simple

-in 8085 ALE signal is to the demultiplexe address and data. 4-5 questions

-1 simple dbms query

-time division multiplexing/carrier signal/nyquest rate 5-6 questions from dis area

-A computer system has 6 tape drives,with n process competing for them.

Each process may need three t

.The maximum value of n for which the system is  
guaranteed to be deadlock free is

A. 1

B. 2(ANS)

C. 3

D. 4

-english reading + simple Apt.

**IS THERE A NEGATIVE MARKING IN THE PAPER ? -> NO**

post some questions which u remember....

plz share some questions or topics from memory

and plz share some question of c and ds.

**Company Citrix @IITM:**

**1.Find a number occurring more than n/2 times in a given sequence in linear time and constant space.**

**2.Coin change problem. Find minimum number of coins needed to form a sum of n given m repeatable coins.**

**IITB-21st oct...**

MCQ:-

1. mostly from Computer networks, Operating System and OOP's (C++).

3 programming questions

1. goldbach's conjecture

2. string rotation

<http://stackoverflow.com/questions/2553522/interview-question-check-if-one-string-is-a-rotation-of-other-string>

3. Given pre and in order traversal print post order traversal of the binary tree. Also report error if for a given combination (preorder, inorder), a tree can not be formed.

P1 - Goldbach's conjecture states that every even integer greater than 2 can be expressed as the sum of two primes.

Given an N ( $2 < N < 1,000,000$  & N is even), find the two primes P and Q such that  $P+Q=N$

Input: Each test cases consists of one even integer N such that  $2 < N < 1,000,000$

Output: Print the values P & Q in single line with P and Q separated by a single space. if there are multiple values for P & Q, then choose one with the lowest value for P. If there is no such value, then print “!!!” without the quotes and you've proved Goldbach/Euler wrong.

Constraints Each test input contains T lines of where each line has an integer N such that

$0 < T < 100$

$2 < N < 1,000,000$

F

---

-----

P2- One can construct a unique binary tree, given task it to output the post-order traversal for the tree, given pre-order and in-order traversal for that tree.

Input:

Each input testcase will consists of 3 lines. first line gives the number of nodes in the tree. second line gives its pre-order traversal with each node seperated by a whitespace. third line gives its in-order traversal with each node separated by a whitespace.

Output

For each input testcase, output should contain a single line which is the post-order traversal for tree with each node separated by a single white space. If no binary tree can be formed with given input, then print "NO" without the quotes.

P3- Given two strings S1 & S2, S2 is rotated version of S1, if S2 can be goS1 without chat by taking the last n characters of S1 and attaching it to beginning of nging character order.(S1 is rotated by n to get S2.) Note that comparison must be case sensitive.

For example:

TRIXCI is rotation of CITRIX by 4 characters (m=4) and IXCITR is rotation of CITRIX by 2 characters (m=2).

Input:

Each line consists of two strings S1 and S2 seperated by a single space. S1 and S2 consist only of a-zA-Z. Each string can be upto 10,000 characters long.

Output:

if S2 is rotated version of S1. Then output the value n by which S2 is rotated, If S2 is not a rotation of S1, then output -1.

Fmi

Constraints

Each input test case will contain T lines of input where each line contains 2 string S1 and S2 separated by space.

$1 < T < 100$

$1 < S1, S2 < 10,000$

Sample Input

CITRIX TRIXCI

BOMBAY BAYBOM

CompuTER PUTERcom

Sample Output

4

3

-1

Explanation since we do case sensitive comparison, for 3, S1 and S2 are not rotations.

### **Company Chronus@IITB:**

Chronus @ IIT B :F

Given a square matrix with black and white cells find the size of the largest square, the border of which has only black cells.

Given a million word dictionary, what is the size of the largest rectangle that can be formed such that each row and each column of the rectangle is a word from the dictionary.

Both the questions are present in the ‘Hard’ section of Gayle’s book.

MCQ- same as IITD

### **Company Chronus @ IIT D :**

It was a pen and paper written test, time 75 min

- 3-4 sections of mcq questions with 6/7 questions in each section (-ve marking is there) :  
sections were : Algo (from gate), Aptitude (one about 5 couple handshake problem), SQL (one about cascading delete),SQL injection and a few web technology related question

- Two coding questions :

1. one was about pruning the largest BST segment expanding from the root of given binary tree.

for example :

f  
1  
/\  
2 3

here the answer would be

1  
\  
3

ITS NOT FINDING LARGEST BST SUBTREE IN A BINARY TREE

2. Two times were given

int noOfClicks(char\* clockTime,char\* currentTime)

in HH:MM format.

There are two buttons to match the clock time with current time. One to increase hours and another to increase minutes.

HH count is from 00-23 and again goes to 00 if it is increased from 23. same is for minutes 00-59.

minute button is working fine but hour button is faulty. When you press hour button, it increases both hour and minute by 1.

You need to count and return the minimum no of button press to match the clock time with current time.

Ex:

clock time 03:12

curr time 04:15

no of clicks: 3

when hr button is pressed, 04:13

minute button pressed twice, 04:15

## Company Chronous@ IIT KGP

same as Delhi

4 sections: Algo/DS , quant, DBMS/SQL , programming  
coding questions were diff

**1:** You are given an array nxn with white and black pixels. Find the largest subsquare having black pixels on its boundaries.

**2:** You are given dictionary containing million words. Form a square matrix of letters such that each row and column forms a word available in dictionary. Write an algorithm to obtain largest size of such matrix.

Chronus @ IIT M

Coding:

Given two words, say source, target. Also given a dictionary of words. Find minimum possible transformations (insert/delete/replace) of source to target such that each transformation forms a valid word in dictionary. Print all the words during transformation from source to target.

for eg. **cat** to **bed**.

**cat -> bat -> bet -> bed.**

**PLEASE POST THE CODING QUESTIONS @ IIT KGP**

**Company Directi**

IIT Delhi:

Question 1 You were given a Binary Tree (not necessarily a Binary Search Tree) to play with, say T. T had some special properties

Each internal node in T had exactly 2 children

Each internal node in T was represented by an uppercase English alphabet (A-Z).

Each leaf node in T was represented by a lowercase English alphabet (a-z)

You were told remember T as long as you could. Hence, you memorised the string formed by traversing T in post-order. You used something similar to the pseudocode below

```
toPostOrderString (node)
if node is leaf
return node.value
else
T = ""
T = T + toPostOrderString(node.left)
T = T + toPostOrderString(node.right)
T = T + node.value
return T
```

Now, time has come to use that string again. The Eye has contacted you. Yes, the secret organisation mentioned in "Now you see me" ( don't tell anyone they are real !! )

You remember the string you memorised back then. You must reconstruct the binary tree T. You are also given a string A. All the characters of A are uppercase English alphabets. Let us assume that T has L leaves. Then, there will be exactly L paths from the root to the leaves - 1 unique path to each leaf.

You have to tell The Eye the number of paths out of L, on which, A exists as a sub-sequence.

Look at the explanation for the Sample Case 1 for clarity.

You have to implement the method explore Paths in the code. explore Paths is passed the following parameters, respectively

N, the number of nodes in T

S, the string representation of the post-order traversal of T. Of course, the length of S will be equal to N.

K, the length of the string A

A, the string you must find in the paths from the root of T, to the leaves in T.

IIT Roorkee

1. Given N,O where N=No. of digits that can be displayed on calculator and O=No. of multiplication to be performed.

The numbers used for the multiplication can be from {2,3,...8,9}

$2 \leq N \leq 8$

$2 \leq O \leq 30$

write function that will return the largest num that can be obtained after O multiplication.

Eg: N=2, O=3

the function should return 98, since the maximum no. generated after 3 multiplications  $2*7*7$ .  
function should return -1 for error or invalid.

2. Given N set of points with X and Y coordinates.

$-1000 < X[i] < 1000$

$-1000 < Y[i] < 1000$

We have to calculate the length of the square that be constructed out of these points having following features:

i. The points should lie on the square,

ii. The sides should be parallel to X or Y axis.

iii. The square should be constructed with minimum possible length.

Note: It is possible that all the corners not be the points.

For eg:

N=5

X[] = {0,2,3,5,7}

Y[] = {3,0,0,0,3}

function should return 7

in case the square can't be formed or any other error return -1

Directi (IIT GUWAHATI):

Two coding questions. There were 11 test cases to pass for each question.

Q.1. Repeated from IIT Roorkee Q1.

Q.2. The question was very big with a story of IPL team selection. The summary of the story is: Royal Challenger needs to form a team of X players. Each of the Y fans of Royal Challenger can select X players of their preference. The team management have a criteria that, at least one player have to be in the team from each of the fan's preferences. So, find the minimum number of players that can satisfy each of the fan's preferences. For erroneous conditions return -1.

Example:

numberOfPlayers = 5

numberOfFans = 3

fanspreferences =

{

“10000”

“00100”

“00010”

}

output = 3

numberOfPlayers = 4

numberOfFans = 3

fanspreferences =

{

“1000”

“0100”

```
“0101”
```

```
}
```

```
output = 2
```

Given function signature:

```
int findminimum(int numberOfPlayers, int numberOfFans, char **fanspreferences)
{
}
```

<http://www.careercup.com/question?id=5734638857224192>

Directi (IIT KGP)

Q.1. Repeated from IIT Delhi Q1.

Q2

You are given a string that consists of digits. The string contains not only digits, but matched round-brackets as well.

Examples of such strings are

- "1234(56)"
- "03(5(68(42)7))"

Note that the round-brackets will always be matched, meaning

- The number of opening and closing brackets is exactly equal
- There will be no prefix that contains more closing brackets than opening brackets

"1234(56)"

"03(5(68(42)7))"

Note that the round-brackets will always be matched, meaning

The number of opening and closing brackets is exactly equal

There will be no prefix that contains more closing brackets than opening brackets

In this string, the opening bracket is always preceded by a digit.

Now, you go through several iterations to get rid of the round brackets. The iteration proceeds as

If the string contains round brackets, pick up any matched pair of round brackets that you find

Repeat the entire expression within the round brackets, except than opening brackets

In this string, the opening bracket is always preceded by a digit.

Now, you go through several iterations to get rid of the round brackets. The iteration proceeds as

- If the string contains round brackets, pick up any matched pair of round brackets that you find
- Repeat the entire expression within the round brackets, exactly as many times as, the digit that immediately precedes the opening bracket in the matched pair

Note that the string after eliminating all the round brackets will always be the same no matter in what order the round brackets are picked for expansion.

For example, consider the string "42(30(1)4(21()))8"

- We first pick up "(30(1)4(21()))" and repeat the expression inside the brackets 2 times.
- We do it 2 times, because the digit 2 immediately precedes this bracketed expression in the string.

The string now becomes "430(1)4(21())30(1)4(21())8"

- We now pick "(1)" and repeat it 0 times, since 0 is the digit that immediately precedes it.
- Repeating 0 times effectively means that we ignore the expression.
- We can do this for both the "0(1)" substrings of the strings.

The string now becomes "434(21())34(21())8"

- Next, we look at "1()". Since the bracket contains nothing, we repeat the empty string exactly 1 times.
- This also effectively means that we ignore the expression.

The string now becomes "434(2)34(2)8"

- We can now expand "4(2)" to "2222" in both the instances above to get the final string "432222322228".
- This string has the length 12.

Implement the method `stringLength` in the given template. The parameters to the method are

- `S`, the string that must be expanded.

Your method must return the length of the string after expanding the expression. Do not try to actually find the expanded string since this string might be too big to fit into memory. Only calculate the length and return it. You may assume that the answer is always less than  $10^9$ . Note that it is possible that the length of the expression in the end is 0.

You can assume that the input string always is always valid according to the specification above.

Sample Test Case 1

"42(30(1)4(21()))8"

Answer as described above is 12

Sample Test Case 2

"1(1(1(30(9(12345678)))))"

Answer is 1. The expanded string is "3"

Constraints

- $1 \leq \text{Length of } S \leq 1000$
- The result will be less than  $10^9$ .
- Any algorithm of complexity  $O(N^2)$  or better should pass.

Note: Be careful when returning a string in C. Declare "char str[]" globally and return "str". Local char arrays are deallocated after a methodlevel2 call ends and will produce Segmentation Faults!

IIT Kanpur

Q1. Given a binary tree where value of each internal node is 1 and leaf node is 0. Every internal node has exactly two children. Now given level order traversal of this tree return postorder traversal of the same tree.

Q2. same as IIT Kgp q2.(actually i think it is IIT R q2) but in place of rectangle they wanted a square( just some additional test cases)

Q3. Given a matrix with 1 and 0 as entries. Find the perimeter of squares which enclose all the 1's.All the 1s are contiguous i.e. there are no isolated 1s.For instance

01000

11100

10000

here the answer will be 12.

Q4.given a string of the form AB2C3 and an int k.

Expand the string as ABABC3 then ABABCABABCABABC.Then what is the kth element. You dnt actually have to expand it as it will violated the memory constraints. You just have to find the kth element.

## **IITB**

1. Question 1 from IITR
2. Given a 2D array containing dots(.) and hashes(#), find the perimeter of area covered by hashes.  
Ex. Perimeter of area covered by a single hash is 4. That of a couple of adjacent hashes(##) is 6. For the following input, the answer should be 15.

```
. # # .  
. # ..  
### .
```

## **Company EBay:**

IIT Delhi:

Shortlisting was done before written exam. Most probably the criterion was B.Tech institute ( like NITs ). The written test had 2 sections with each having a separate cut off. 1st section : 30 mins, 7 apti questions. Tough. 2nd section : 30 mins, 10 technical questions. High level of object oriented concepts and good level of java ( most of the ppl didn't know that much java ).

**(please update the questions also thanks)**

IITB :

Same as above :P

How was shortlisting done?? couldn't get the above written reason ???

Shortlisting was done based on the undergrad college. And there is no list they adhere to. It's upto their whims and fancies. Was quite silly.

**IITM: Same**

puzzle similar to <http://www.suhelbanerjee.com/2010/02/puzzle-highly-recommended-one.html>

## **IIT Kgp**

same as above...:)

First question in aptitude section was LR type.

2nd Section:

1. Predict output of a Java code. Something related to assert function in Java.
2. One question on working set model from OS.

### IIT Guwahati

#### 1. Aptitude test : 7 questions 30 minutes

- Q1. i. He gave five sets of rules each specifying the relation from which you have to fill a table.
- ii. In the table the columns were Father, Mother, Child, Last Name, Location.
- iii. The column(father) is filled for you, You have to fill the remain entries using the relations specified above.

Ex: Mary's Mother isn't a Smith(Last Name). Michelle found her daughter at a cradle. Ali and his wife Labir didn't find their child at roller coaster etc.

Q2. Given an amount for two objects and some procedure of selling the objects you have to find their values.

Q3. User starts moving from a point in some direction and finally you have to say his position with respect to the first one.

Q4. Some encoding rule. like CCQW is written as DDRY what will be the code of HIJK

Q5. Find the missing number in a table.

Q6, Q7. Given a pie chart and you have to calculate the percentage of S with respect to P.. on similar lines.

#### 2. MCQ's based on Java,C++,Networks,OS. : 10 questions 30 minutes.

Then we have had 3 rounds of interviews for the shortlisted students.

They just see how enthusiastic you are . What you expect from e-bay. How you can help e-bay.

What do you want to do in e-bay. Your interests and what you did these 4 years.

An Advice : Go through your CV thoroughly. You should be able to describe every project you have mentioned in the CV in a neat manner. Finally I would say when the interviewer asks "Any Questions?" . Please do ask few questions related to e-bay. This makes the interviewer to feel

that this guy is really interested in e-bay.

**Best Luck!!**

**Company Epic:**

**IIT Delhi:**

Round 1:- 1.5 hr MCQ test with 3 sections:epic

1. question in 10 2 min
2. Math section 14 question(Simple)
3. New programming language(20 questions)

**CAN ANYONE PLEASE POST SOME QUESTIONS FROM THE 3rd SECTION**

^ Questions related to MIIS programming language. Basic concepts were defined in the questions, and then simple things were asked.

**3rd section** some function is given with its definition and some expression is given as argument in that function then they ask what is the output.e.g. PIECE function is given.

**IIT Roorkee**

(MIIS programming language )

these are based upon the definitions given

- a) Numeric Constants (integers)
  - b) String Constants
  - c) Variables which can take both both Numeric and String Constants without any type declaration
  - d) The Concatenation operator on Variables
  - e) The Logical Operators min(&), max(!), negation ('), greater than( > ), less than( < ), equal to( = )
  - f) The function of 'x ="null"
- if  $x = 3$       in an expression ' $x + x$  is  $(0)+3$
- if  $x = 0$       but in a logical expression ' $x = x$     gives "null" = 0 as false.

- g) and some mix of these operators together. like concatenate and (‘) on these variables and asking what will those values become
- h) PIECE function that will work like \$PC(“abc,cde,fgh”,2) will print “cde” as , is DELIMITER and 2 is position holder.
- similar extension of this

Round 2:-

This was an online round where you have to just write code (properly documented). No Compilation and code running. 2hr round with four questions.

All candidates were given different questions, which can be found on [careercup.com](http://careercup.com) by finding results for Epic Systems. Just have a look through these questions.

Edit(29th Oct 2013):

**Did the coding round include compilation and testing?**

**No (IITK)**

**second round (Coding - one of the set)**

1. Define a number to be 'valid' if all its digits are in increasing order starting from unit's place. Now given a number k, find all possible k-digit 'valid' numbers.
2. Given two words that are anagrams of each other. Swap one word (only adjacent swapping of letters allowed) to reach to the other word. Example, <http://www.wordsmith.org/anagram/>
3. A number X is said to be 'seed' of number Y if multiplying X by its digit equates to Y. For example, 123 is a seed of 738 coz  $123 \times 1 \times 2 \times 3 = 738$ . Now given a number find all its 'seed'.

**Solution???** <http://pastebin.com/MeqzY9Bp>

1. Like in normal phone if we press 2 single time it is A and press it two times it is B three times it is C, same for other number keys, \* means space. You are given one big number like 337444222\*777799977783367777 we have to print EPIC SYSTEMS
2. Number satisfies some property we have to find whether given number follows that property.
3. Input {1,7,6,3,5,8,3}

Required sum: 16

Output : 2-4

Since here index starts at 1 and we have to print all contiguous indexes whose location values adds up equal to given sum.here 2-4 index value sum is  $7+6+3=16$ .

They said that following link was very helpful in particular:t

<http://placement-papers.org/category/placement-papers/epic-systems/>

## IIT Roorkee

These were Easy but time is important

1. A person has checking amount is 50000 \$ and cash 500 \$. he bought 2 tv's each \$1995 of which he paid 1/15 in cheque and 1/10 in cash (Assume rest amount not paid). Then what is checking amount left and what is cash amount left Ans: 49734,101
2. "apple" 40 cents "banana" 60 cents "grape fruit" 80 cents then "pear" = ? cents  
Ans : **40( 2 vowels)**
3. 16 47 64 81 121 pick odd one out ?? **ans:47**
4. What is the amount of time before 5:00 pm now, if before 30 minutes the time after 3:00 pm is 4 times that of before 5:00 pm **ans : 66 min (how???)**
5. A moth can (climb 5 inches and drop backs 4 inches each time) in 1min . how much time will it take to reach the top of 60.5 inch bar. **ans: 58**  
**(how??? The answer assumes that the moth took 1 minute for fall also. So it will reach 56inches in 112 minutes. Next minute it can go 5... but we need only 4.5, which will take 0.9m. So 112.9m)**
6. Sequence 4 7 13 --- 49 97 fill the missing element. **ans:25**
7. ?????

## Company Epic IITKGP Coding round:

### Some MCQ's related to Aptitude :

1) Bank account question

2) Bank account question

3) yearly salary is given for a worker. a year=52 weeks

5 workers 5 week salary is given so how much salary remained?

4) First person at 1 (5 office/min)and second person at 106(10 office/min)

and their respective Speed given so where they will meet ? -- 36 office number

5) 1 for a 1\$. customer says I want 600 then take these 3\$.

what will customer buy ? -- dont remember answer for this

6) A goat jumps 3 feet up and slips 2 feet in one minute.

so how many min she will take to reach to go up at a pole  
of height 70.5 ? --- here data changes for some people

7) 2.5 humans cut 2.5 trees in 2.5 days then, 5 human will cut

how many trees in 10 days ?

**20 trees**

**(Time is a crucial factor. You'll get more than enough time. But finish it as early as possible)**

1. You are given a string. Gibberize it's eligible characters under the constraints:

- eligible characters are: a, A, e, E, i, I, o, O, u, U
- similarly you will have one gibberized character corresponds to each eligible character.
- you can assume one function is given to gibberize these characters
- at most 4 eligible characters from the rear of the string can be gibberized
- exempt first 3 eligible characters of the string from any gibberization

2. Given an NxN grid of alphabets. You need to search one word in that grid. Word can be present in any row (in reverse order too), any column (in reverse order too) or any diagonal contiguously Solution:<http://pastebin.com/4ptu8VFi>

3. You need to label files from number 1 to N. N will be taken from input. One key is broken. Input the broken key too. Print largest possible label a user can print. e.g. N = 1232 and the broken key is 3 then largest possible label will be 1229.

4. Print all possible valid passwords of N (take N as input) letters under the constraints:
- letters in each password will be english alphabets and in ascending order only. e.g. “ably” is valid password of 4 digit but “able” is not.
  - letters can be in SMALL or CAPS. e.g. “aBly” is also valid

5. Print all anagrams of a string such that uppercase letters and letters other than alphabets position is fixed. <http://pastebin.com/Emqdn0h9>

**IITB:**

Almost same questions as above.

### **Company Flipkart:**

**@IITM**

**<which type of MCQ..plz explain if u can and how many interview rounds are there?>**

20 MCQ, 2 coding questions

Some MCQs are:

1. how many bits are required to represent mac address
  2. last non-zero digit in (551)!
  3. minimum number of nodes in a complete binary search tree
  4. how many ways a garland of atleast 2 roses,3 lilies, 1 lotus..flst 5 flowers can be formed?
  5. which data structure is used for efficient sequential insertion and searching?
  6. we have to store the likes in facebook so that the people who liked this are showed in sorted order(alphabetically). Which data structure can be used?
  7. digital signature in cryptography is ( a. symmetric b. asymmetric c.both(a & b) d. advanced)
- , Some RDBMS qs Unix commands ,Network qs

Coding:

1. Find the botttom view of a binary tree.

Second Question i don't remember ,plz update if anyone remembered.

google

### **Company Google:**

IITG, IITM, IITR, IITB, IITKGP, IITK

**MCQ**

20 questions from previous year paper already posted.

Link: <https://www.dropbox.com/s/v3eyb56v8kbqu1z/Google.pdf> (previous paper)

### **Coding question:**

In a language, there are only 4 characters ‘h’, ‘i’, ’r’, ‘e’. and we have to write a function which takes a string as input and returns whether the given input string is a “valid word” or not.

Similar to this one:o

[http://community.topcoder.com/stat?c=problem\\_statement&pm=12778&rd=15705](http://community.topcoder.com/stat?c=problem_statement&pm=12778&rd=15705)

Define of valid word :

1. A given word is a valid word if it is of the form  $h^n i^n r^n e^n$  where  $n \geq 1$ .
2. Valid words has concatenation property i.e. if  $w_1$  and  $w_2$  are valid words  $w_1 w_2$  is also a valid word.

IITD

coding ques:

<http://www.spoj.com/problems/BOOKS1/>

instead of giving the complete partition of sequence,only finding the minimum no of pages assigned was asked.

### **Company Informatica:**

IITD : Round 1(40 minutes):

35 MCQs most of them from GATE 2011 and 2012.

Topics were CN,OS,DBMS,OOP

Round 2 ( 75 minutes )

Subjective : We have to give explanations of answers, write some code (compiler was not provided - write only code in text ). Not too much coding was required but thorough understanding of computer science was properly tested.

IITR : MCQ same as IITD.

second round:

- 1.swap two string.
- 2.fork() question.
- 3.Red white tree (prune max red node) with constraint that a node can be white if its all childrens are white.
- 4.efficient fibonacci (dynamic algo) recursive.

5.a code is given you need to find out how many byte memory allocate to stack and heap.

```
float *a;  
double **b;  
char *s = "informatica";  
int *p = new int[10];
```

IITG :

Round 1 : 35 MCQ in 40mins.....90% of questions are from Gate 2011 and Gate 2012 paper.

Cutoff for this round was high(close to 30).

Round 2 : 15 Subjective questions in 75 mins. some of the questions were to check errors and issues with the given code.

ex : How many times Hello World is printed in the below code :

```
int main()  
{  
    for(int i=0;i<7;i++){  
        temp = fork();  
        if(temp>0)  
            break;  
        printf("\n Hello World");  
    }
```

Some simple find output,errors and issues with the code questions and we also have to give correct explanations for the output questions to get credit.

Its difficult to solve all questions in Round2 because we have to explain a lot on every question.

For round 2: (Total 15 question)

All the above mentioned questions were there plus following questions were also there:

- 1 A directed graph was given. You have to write the code to copy the graph if it contains cycle.
2. You will be given a descriptive problem, it was very long. You have to write solution for the problem.
3. Remaining questions were C output questions.
  - a.) 

```
char * string1 = "Something 1";
char *string2 = "Something 2";
```

you have to write a code to swap the strings. (Means after swapping if they print the strings, the result should be the swapped result.) -- Use `void swapString(char **str1, char **str2);`
  - b.) Code was given to copy the string. You need to tell the errors in the code. And write the correct code with explanations in the space provided.

```
void copyString(char *dest, char *src)
{
    int i ;
    dest=(char *)malloc(strlen(src));
    for(i = 0; i < strlen(src); i++)
        dest = src;
}
```

- c.) A code was given. A function calls itself recursively. It has one static variable. They were checking the static variable and based on the values of the variable they were printing something. So you have to tell the output of the code with explanation.

Basically you have to be clear with static variable concept.

- d.) Code was given. You have to tell how many times “Hello world” will be printed with

explanation.

```
void main()
{
    int i, temp;
    for(i = 0; i < 7; ++i)
    {
        temp = fork();
        if(temp > 0)
            break;
        printf("Hello world.");
    }
}
```

d.) Output of the code:

```
#include <stdio.h>
#include <stdlib.h>

#define VALUE1 20
#define VALUE2 44

int f(int *x, int i)
{
    int *y;
    y = (int *)malloc(sizeof(int));
    *y = *x + VALUE2;

    switch(i) {
        case 0:
            *x = *y + 1;
            break;
        case 1:
```

```

*x = *y;
break;

case 2:
    //something
    break;
}

return (*y);
}

int main()
{
    int *x,i,j;
    x = (int *)malloc(sizeof(int));
    *x = VA
}

```

LUE1;

```

i = f(x,0);
j = f(x,1);

printf("i = %d j = %d x = %d\n",i,y,*x);
return 0;
}

```

### IIT Bombay:

Round 1: 35 MCQs in 45 minutes. Most of them were from GATE 2011 and 2012 and others from older GATE papers.

Round 2: Shortlisted students were allowed to write a subjective exam. One option out of C/C++ and Java had to be chosen prior to start of the test. 15 questions in C/C++ with all the above mentioned questions present. We had to find output or logical errors in program in most questions with few on writing code/pseudocode. A few more which were asked were:

```
a) int main()
{
static int i=6;
if(--i)
{
    main();
    printf("%d",i+1);
}
}
```

```
b)
char *p = (char*)0;
int *q = (int*)0;
float *r = (float*)0;
double *s=(double*) 0;
char *a= p+1;
int *b=q+1;
float *c=r+1;
double* d=s+1;
printf("%d %d %d %d",a,b,c,d);
```

```
c)
int main()
{
    int *diptr, *iptr,i;
    diptr = iptr = (int*) malloc(4*sizeof(int));

    for(i=0;i<4;i++){
        *iptr = i*10;
        iptr++;
    }
    for(i=0;i<4;i++){
        printf("%d ",*diptr);
    }
}
```

```

diptr += sizeof(diptr);
}

}

```

d) Below function gives 1869 on some compilers while gives illegal access error on others.  
Reason for this behaviour.

```

struct A
{
int *p;
A(int x){
    p=(int*)malloc(sizeof(int));
    *p=x;
}
~A() {
    free(p);
}
};

f()
{
    A yod=indep;
}
A indep(1947);
int main()
{
    f();
    A dob(1869);
    cout<< *indep.p;
}

```

If you choose **java**, then you have to attempt 21 questions. Out of which 5 questions are common to c/c++ section. In the Java section most of the questions are on Java basics

(inheritence, polymorphism), Objects equality, Initialization of arrays, Compilation errors identification, Run time error identification [compile time errors | Runtime Exceptions] , Inner Classes, Threads.

Tip: If you are very good at small aspects of java, then only opt for java otherwise it will be very difficult to predict the answer and to write proper explanation for that.

### **microsoft:-**

1. 48 bit architecture, what is size of virtual address space?  $2^{48}$  bytes
2. 1 rabbit couple. Couple will start producing other couple only when their age is one month. Initially in first month one couple is there. how many couples will be at the end of year.  
Hint - fibonacci series
3. Some cpp codes. and asked output. (i.e. Virtual Functions)
4. C codes and output.
5. Find bugs in given code.
6. Complexity of BFS if adjacency list is given.
7. What is used in Demand paging  
a) sequential search b) binary search ....Answer please ..
8. If pointer to function is declared the how to call that function.

**Coding Round - (60 min) 2 questions**

Same as IIT bombay

**Coding Round - (60 min) 2 questions**

Same as IIT bombay

**1) check is two words are anagrams.**

**2) print last 10 lines of giv**

**IIT Bombay**

15 - MCQ (30 min)

1. In a tree every node has 2 children or 0 children. if there are 'n' nodes with 2 children then how many with 0 children? ans:  $n+1$   
n+1.IIT Kanpur

15 - MCQ (30 min)

Same as IIT Bombay questions

some more -

1. 48 bit architecture, what is size of virtual address space?
2. 1 rabbit couple. Couple will start producing other couple only when their age is one month. Initially in first month one couple is there. how many couples will be at the end of year.  
Hint - fibonacci series - 233

<http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibrab.html#rab>

3. Some cpp codes. and asked output. (i.e. Virtual Functions)
4. C codes and output.
5. Find bugs in given code.
6. Complexity of BFS if adjacency list is given.
7. What is used in Demand paging

a) sequential search b) binary search ....Answer please ..

8. If pointer to function i
2. If we add a constant weight to each edge in a graph will the shortest path “**between any two vertices**” change ?

Ans: (May or may not change) /\*this will be Depends, not NO, consider a graph whose one path from A to B has 4 edges of 1 and other path with 2 and 3, now add 1 to all edges..now shortest path becomes 2 and 3\*

3. how many '0' in  $100!$  ? ans:  $24 (100/5+20/5+\dots)$
4. For recursive fibonacci , what is its complexity ? ans :  $O(2 \text{ pow } n)$
5.  $i=2, \text{printf}("%d%d", ++i, ++i)$  ans: 4 4 /\*sequence point concept in C comes into picture here\*/ (depends on the compiler ??) ( it depends on the compiler, giving 4 3 here (where??))
6. int c[]={2,3,4,5,6},  
int \*p=c, int \*q=c,  
(1)for(i=1 to 5){printf("%d", \*c); q++}  
(2)for(i=1 to 5){printf("%d", \*p); p++}

ans : 2222223456(it should be continuous because no \n is there.)

Many questions were of the kind : give the output of following C/C++ code

7.  $x=4|3<<4$  ;  $x=$  ? ans : 52

8.  $x= 2, y= 4, z=10$  ; if ( $x < y < z$ ) {printf("abc")} else {printf("pqr")} ? ans : abc

9.  $x=1$ ; mask =  $\sim(x<<5 - 1)$  . What is

(1) mask & 48

(2) mask & 64

(3) mask & 121

ans: 32 64 105

**10. In an page fault system implementation , what is “good” way to access pages ? and**

**(1) Linear search**

**(2) Arithmetic indirection**

**(3) Binary search .**

**(4) Vector Operation**

**Correct Ans: Option-(4)and (1)..it was a multiple correct type.....**

**Other way that are also good are---Stack and pure code**

11. which of the foll gives most efficient way to access elements sequentially?

(1) LL (2) DLL (3) vectors

**Answer--? I think vector .. is it correct? // yes it is //cache locality**

<http://stackoverflow.com/questions/238008/relative-performance-of-stdvector-vs-stdlist-vs-stdlist>

12. what is the output ?

class A{

    public: void foo(){

        printf("a");

    }

};

class B : public A { public: void foo(){printf("b")}};

class C : public B { public: void foo(){printf("c")}};

void foo(B &b){

    b.foo();

}

main(){

```
C c;  
foo(c);  
}
```

**output :- b**

13. What is the data structure that has O(log n)complexity on averaging for the operations: search, insert, delete. ANS:AVL Tree correct?

14. Find the output:

```
#include<stdio.h>  
int fun(int num) {  
    while(num > 0) {  
        num=num*fun(num-1);  
    }  
    return num;  
}  
void main() {  
    x = fun(8);  
    printf("%d",x);  
}  
ans: 0
```

15. Find the output: int fun(int num)

```
{ if(num<3)  
return 3;  
return num+fun(num-2);  
}  
main()  
{  
int x=fun(12);  
int y=fun(13);  
printf("%d %d",x,y);  
}
```

2 coding questions - 1 hour

Coding questions:

1. Given a 2D matrix. Each cell was filled with a specific color denoted by single character eg. for blue -‘B’. If one position is clicked (x,y), colour present at that position would be deleted. If the same colour is present in neighbourhood (up/down/left/right) then it would also be deleted. After deletion blank spaces will be replaced by the value present in the cell above that. In case no value present above the cell then blank entry will be replaced by 0.

Input

x:1 y:1

BGB

BGG

BBB

Output

B00

B0B

BBB

**WHAT SHOULD BE OUTPUT OF THIS ?????**

**B G B B**

**B G G B**

**G G B B**

**B G G B**

**start from 1,1**

**B 0 0 B**

**B 0 B B**

**G 0 B B**

**B G G B**

2. Given a linked-list swap the alternative nodes (assume list have even number of nodes.)

Input : 11->12->13->14

Output : 12->11->14->13

Re-test :

1. Given 2 strings, check if they are anagrams of each other.

2. Delete every nth node in a linked-list.

**What does this question mean, can someone please give an example.**

Let the LL be, 1->2->3->4->5 and n = 2, then resultant list will be: 1->3->5

## IIT Kgp

15 MCQ. Mostly were asking C/C++ output (Some questions were repeated from IITB paper above). Some examples are:

```
unsigned int i = 1<<10;  
for(; i>=0; i--) printf("%d\n", i);
```

Ans: Infinite loop

how to call pointer to a function:

ans:(*\*foo*)(2)

asked to find output from

a)C++ basics=> several types of constructor for a class(e.g. copy constructor)

b)Virtual functions and calling those functions among classes

```
unsigned int a=-1;  
unsigned int b=~1;  
int z=a*b;  
printf("%d",z);
```

Ans: 2

rabbit fibonacci series. → plz give reasoning.

Ans: 233

```
int n = 1000, c = 5;  
do {n/=c;} while(c--);  
printf("%d", n);
```

Ans: Arithmetic error (divide by 0)

```
class A{  
public: A(){cout << "AC ";}  
~A(){cout << "AD ";}  
};  
class B: public A{  
public: B(){ cout<<"BC ";}  
~B(){cout <<"BD ";}  
};  
main()  
{B *b1 = new B(); B b2;}
```

Ans: AC BC AC BC BD AD

```
int fun(int num){  
if(num < 3) return 3;  
return num + fun(num-2);  
}  
main(){  
printf("%d %d\n", fun(12), fun(13));  
}
```

Ans: 43,51

void swap(int \*a, int \*b)

(a) call by name (b) call by value © call by reference (d) call by pointer

Ans: Call By Pointer becoz in C++ we have both CBR and CBP and in C++ for CBR we dont

use \* in operation we refer object only just by their name in CBR

```
int fun(int num){  
    int val = num<<3;  
    val += num;  
    return val;  
}  
main(){  
    printf("%d %d %d\n", fun(0), fun(1), fun(3));  
}
```

Ans: 0 9 27

2 codes:

1. prune all the nodes from a BST which are not in the range *minValue* and *maxValue*
2. print last 10 lines of a very large string

IIT Roorkee, Delhi:

Same as IIT KGP

Company Microsoft----IIT Guwahati:

Round 1:

15 MCQ questions. Some of them were repeated from other IIT's

Q.1.

code 1:

```
int MAX=1000;  
int a[MAX][MAX];  
for(i=0;i<MAX;i++)  
    for(j=0;j<MAX;j++)  
        a[j]=i*j;
```

code 2:

```
int MAX=1000;
```

```
int a[MAX][MAX];
for(i=0;i<MAX;i++)
for(j=0;j<MAX;j++)
a[i]=i*j;
```

Which is correct?

- a. code 1 is faster
- b. code 2 is faster
- c. both are same in RISC architecture
- d. both are about same

My ans was (b). Is it correct?

Q.2. What is the output:

```
unsigned int x = -1;
int y = ~0;
printf("%u,%d",x,y);
if(x==y)
printf("same");
else
printf("not same");
```

- a. compilation error.
- b. 45.....,-1 same
- c. 45.....,-1 not same
- d. i don't remember

My ans was (b).

Second Round:

2 Coding questions. We suffered a lot for Internet Explorer in this round. Some characters were not understood in the questions. :'(

Q.1. In a Tic-Tac-Toi game two players are playing where player 0 is denoted as 0 and player 1 is denoted as 1. Given a linked list of moves made by the players determine who is the winner and in how many moves he required for winning.(You have to just print )...Rest of the part I didn't understand.(Looks very easy question...but IE made it tough) :'(

```
Struct Move{  
    int p; //Player number  
    int x; //x and y pos in the tic-tac-toe  
    int y;  
    struct Move *next;  
};
```

The sample function to write is:

```
void playGame(struct Move *move, int N)
```

Q.2.

Given an array if in a position let  $a[i][j] = 1$  then print all it's row and column 1. You should not consider a position 1 after you made it 1 in your past computation.

sample(input):

(i)00100	(ii)10
00000	01

output:

(i)11111	(ii)11
00100	11

### **Company Morgan Stanley:**

#### **Company NVidia:**

IIT Bombay

@IIT B --

<What was the time limit? >; 1 hr>

Approx how many questions in each section..? atleast on the whole how many questions?

<How many were shortlisted ..%??, NA>

<Was this a pen-paper test?, Yes>

How many questions in each section?

If possible please post few more questions.....

**4 sections with sectional cutoff :---**

Section(1)-..C output questions- pointer arithmetic, pre-increment,post-increment,union

Q

```
x=25;  
if (!!x)  
    printf ("%d", !x);  
else printf (x);
```

.Q. enum a{A,B=2,C}

```
print(enum);
```

- a. 0 2 3
- b. 1 2 3
- c. 0 2 2

Q.

```
int x=0;  
while(x>10)  
{  
    --x;  
}  
printf(x)
```

section(2)-- Data structures- most questions were very easy. I only remember:

Q.

section(3)-- OS:

Q. A. 4 frames. How many page page reference string was given faults with LRU.

Q. Which of the following doesn't need synchronization with multiple threads:

- a. accessing a global variable
- b. accessing a file
- c. modifying a variable on stack

Q. What is Memory mapped I/O with 4 options

section(4)-- Aptitude-- difficulty level was moderate'

## **Company Oracle:**

### **IIT Guwahati:**

Most questions from previous placement questions and there were new ones as well  
(Those who remember questions individually can add them)

### **IIT Bombay**

Q1: When stack used for parameter passing , What is the protection ?

ans ??0

Q2: O/P of fo

llowin code

main()

{

int i = 10;

i = !i > 14;

printf("%d", i);

}

Answer was 0

Q3: How OOS achieves system behaviour?

Q4: Which is not a OOAD method? 4 options were given

data driven

behavior driven

use case driven

the life-cycle stages

*the degree of formalism*

Q5: worse case time to search in sorted LL?

ans :  $O(n)$

Q6: Syntax of pure virtual function for abstract class (c++)?

ans: `virtual void f() = 0;`

Q7: Time complexity to insert in stack(implemented through LL)?

ans :  $O(1)$

Q8: Time complexity of Quick sort ?

ans : avg case :  $O(n \log n)$

worst case :  $O(n^2)$

Q9. Many questions from AVL trees : given BST , convert to AVL tree, preorder, postorder

Q10. Some people also got questions on Red Black trees. Insertion and deletion

Q11.Questions of double stack implemented on an array which starts from ends of arrays

Any updates from completed IIT guys??

IITKG and IITR: Mostly from previous year papers and it was online !!!<<**Provide Links**

### **Company Qualcomm:**

IIT(BHU)

Same as previous year :)

<http://interviewfeedbacks.blogspot.in/2012/06/qualcomm-written-test-and-interview.html>

### **Company Samsung:**

!

IITM

Written Test:

20 MCQ questions.

Very basic of C and data structure like post order traversal is left, right, root.

IITD:

If two threads are incrementing a variable 100 times each without synchronization, what would be the possible min and maximum value

Written Test: 20 questions

Extremely hopeless MCQs. Very basic ones.

IITB:

20 MCQs mostly based

on C, also had data structures (tree, linked list, queue) and OS.

IIT Kgp - same as IIT M/ IIT D

Could you post questions or link from where questions had been taken??

1 q on free(ptr)

1 on realloc()

1 code on doubly linked list .. choose the correct output

1 on which is shortest path algo ..... options were Krushkal, Dijkstras, and two other random options

one question on size of ptrs ....

2-3 questions pointer to functions

one on in order traversal

**Company Symantec:**

Symantec Question somebody?

## **Company Walmart:**

Walmart Online Test Question IIT Roorkee

MCQ:

1.Sql Query is given over a small database and we need to find out natural join.

**2.Answer: min:2,Max:200...**

Doubt: I think min should be=100, kindly clarify?

see here <http://www.careercup.com/question?id=18315663> . **ANS:** it should be **2** only. suppose first thread reads 0 and second threads does 99 increments. i.e 99 . now first thread writes 1 over 99 and second thread now read 1, now first thread increment 100 times and then second thread increment 1 and writes 2.<http://www.careercup.com/question?id=18315663>

3. a c program we need to find out complexity of code.

4.In dijkstra if use d-ary heap then complexity?

5.support and confidence for a transaction.support and confidence for a transaction

6.give Matrix M1:10x100 M2: 100x20 M3: 20x5 M4: 5x80 find minimum multiplication required:(gate 2011 question)

**Ans : 19000**

7.Expectation question R = 1 is what?(gate 2011 question)

**ANS : R>=0**

8. given  $f(x) = \frac{1}{6}$  for  $x = 0, 1, \dots, 5$  and  $x$  is the number of cakes sold by a baker on one day. the

profit is \$1.00 / cake and loss is -\$0.40/ cake then what is the number of cakes he shall bake ?

note: cakes can not be stored for next day

9.linklist having a loop than some constraint is given on it we need to find out which is true.(easy one)

10.Don't Remember.

11.Walmart second coding question:

we have stream of palindrome in increasing order

like:{1,2,3,4,5,6,7,8,9,11,22,33,...101,111,121,131...212,222,232,...}and they are forming a n-digit number like:

number = 12345678911223344.....10111121131..(all palindrome in increasing order)

then we have to find the kth digit of the number.

12.Engineers at @WalmartLabs have decided to call any integer(+ve, -ve or 0) that is divisible by at least one of the single digit primes (2, 3, 5, 7) as Walprimes. Thus -21, -30, 0, 5, 14 etc are Walprimes, while -121, 1, 143 etc. are not Walprimes.

Now, consider a n-digit integer  $d_1d_2d_3..d_n$ . Between any 2 consecutive digits you can place either a (+) sign, a (-) sign or nothing. So, there are  $3^{(n-1)}$  different expressions that can be formed from it. Some of the expressions so formed may evaluate to a Walprime. For example, consider the 6 digit integer 123456:  $1 + 234 - 5 + 6 = 236$ , which is a Walprime, but  $123 + 4 - 56 = 71$ , which is not a Walprime.

Your task is to write a program to find the no. of expressions (out of the possible  $3^{(n-1)}$  expressions) that evaluate to a Walprime, for a given input. Note that leading zeroes are valid.

For example, if the input is 1202004, it can be split as  $12 + 020 - 04$  etc. Also, the input itself can contain leading zeroes.

Input format: (Read from stdin)

The first line of input contains a single integer 'T' denoting the no. of test cases.

Each of the following 'T' lines contain a single string 's' (of length 'n') denoting an input for which you need to find the no. of valid expressions evaluating to a Walprime.

Output format: (Write to stdout)

Output exactly 'T' integers (one per line), where the ith line denotes the no. of valid expressions that evaluate to a Walprime for the ith input string. Since the output can be large, print all the quantities modulo 1000000007.

Sample testcase:

Input:

2

011

12345

Output:

6

64

Explanation:

For the first test case,  $s = "011"$ . There are  $3^2 = 9$  valid expressions that can be formed from this string, namely  $\{0+11, 0-11, 0+1+1, 0+1-1, 0-1+1, 0-1-1, 01+1, 01-1, 011\}$ . Out of these 9 expressions, only the following 6 of them evaluate to a Walprime:  $\{0+1+1, 0+1-1, 0-1+1, 0-1-1, 01+1, 01-1\}$ .

Constraints:

There are 3 data sets.

For the first data set (5 points) -

1

For the second data set (10 points) -

1

For the third data set (15 points) -

## **Comapny Walmart Online Test Question IIT Kharagpur**

10 MCQ 2 coding

1. Cube to be painted with 6 different colours on 6 faces..how many possible cubes?if on rotating 1 configuration, we get another, then that is not to be considered.

Ans : $30 \ ?(5!/4)$

2.  $(777^333 - 333^777)$  what is the digit at one's place LSB in the resulting no.

Ans :  $0 \ ?(7^333 \% 10 = 3; 3^777 \% 10 = 3)$

3. n elements unsorted array (their values are in range 0 to k-1)..minimum time to calculate median

4. linked list with last node pointing to one of the previous nodes(cycle)..how much time required to detect the cycle and make the last node point to NULL(i.e to remove the cycle)

5.  $O(n)$  complexity is required to calculate  $n/4$  th sorted element of an unsorted array quicksort pivot element is chosen to be that.what is worst time complexity of quicksort

6. Infinitely large no of elements in a b-ary tree. b is given. U need to search for an element at finite depth. possible methods BFS,DFS,iterative deepening depth 1st search (IDDFS). Dn some statements given about their complexities. This 1 was a multiple correct question.

7. n arrays to be sorted by merge sort. time?

**\*\*\*\*\*what about Q8,9,10? Please update them\*\*\*\*\***

11. Piles of coins are given (ex. 5 piles : 9,0,5,1,5 ) total 20 coins.. The minimum no. of moves required so that all piles have equal no of coins (4,4,4,4,4) (ans for this is 9 moves) Rules: one coin can be moved to only adjacent piles..i.e. jth pile coin can be moved to j-1 or j+1 if they exist

Level 1 :  $n < 10$

Level 2 :  $n < 100/1000$

Level 3 :  $n < 10^6$

12. Tiles in the form of a string consisting of only B or W ex. “BWW”, “BBBWWBB” ..etc given  $n$  tiles..find the largest possible chain of tiles by joining them..

Joining rules:

The last letter of a Tile should match the first letter of other tile.then they can be joined ex. BW and W WB are joined as BWWWB but BW and BW cant be joined

**Any constraints on  $n$ ?**There were three levels of test cases :

Level 1 :  $n < 10$

Level 2 :  $n < 100$  or  $1000$  (don't remember)

Level 3 :  $n < 10^5$

### **IIT Bombay:**

10 MCQs

2 Coding Questions:

1. Given two numbers L and R, find the highest occurring digit in the prime numbers present between L and R (both inclusive). If multiple digits have the same highest frequency print the largest of them. If there are no prime no.s between L and R, print -1.

Testcases:

L=1, R=30, Ans=1

L=13, R=13, Ans=3

L=4, R=4, Ans= -1

2. Given a string s of ‘H’s and ‘T’s denoting heads and tails, there are 2 possible moves at every point:

a. Flipping a ‘T’ by ‘H’ or ‘H’ by ‘T’ is a valid move

b. Switching every character of a prefix of s, i.e., for any  $1 \leq m \leq n$ , replace all Hs with Ts and all Ts with Hs in  $s[1...m]$  is also valid.

Find the min. no. of moves to convert a given string into all ‘H’s.

eg: HHTH => flip 3rd position => HHHH

HTTT =>(flip prefix) => THHH => HHHH

## IIT Delhi

online test on interviewstreet.

9 single option objective, 1 multiple option objective, 2 coding questions.

Coding 1. [CodeChef Link to this problem.](#)

Coding 2. Input is again array of integers(can be negative also), and two numbers L and R ( $L \leq R$ ). Output the number of subsets who have sum between L and R inclusive.

Again, please fill in sample tests here.

## Company Walmart - IIT M:

MCQ: 10 question

Coding:

1. Given a string ( with only ‘a’- ‘z’ characters and of length N), find the number of permutations that are palindromes.
  
2. There are N piles of coins. Array ‘A’ of length N contains the number of coins in each pile. Array ‘C’ of length N contains the cost to add/remove 1 coin to the corresponding pile. Goal is to make the array ‘A’ contain equal values. What is the minimum cost? Infinite supply of coins is allowed.

## Company Wooquer@IITR:

## **2 coding questions**

**1)Next higher number with same number of set bits**

<http://www.geeksforgeeks.org/next-higher-number-with-same-number-of-set-bits/>

**2)print binary tree from top to down and bottom up manner (Vertical zigzag).**

**mcqs, based on simple mathematics, algos ,os,networks .**

## **Company Yahoo:**

## **Company CitiCorp :(NIT-W)**

**The coding is to be done on online compiler we have to run all test cases also.(Amcat)**  
general apti questions (simple only) logical reasoning

Programming questions (80 min) 2 questions were asked to each candidate some are:

---

you are given a string and u need to encrypt it

for eg: 01234 0123 012 0123456

hello dere and welcome (given string)

hfnos dfth .. .. (output string)

.

so u need to add the index of character to itself Also if the character is 'z' and u hv to add say 3 to it then it should wrap around and be 'c' If it is 'Z' then it should be

---

'C' <http://ideone.com/oVI49q>

a adjacency matrix is given and hv to find whether it represents Graph or Tree?  
soln: u hv to find if cycle exists.

---

to traverse the link list and find if there is a cycle in that link list

---

#####

total duration of test was 2:30 hrs of which 80 min is for coding ques apti questions are easy only.. so u'll be shortlisted on the basis of coding ques only.

### **Citicorp @IITD :-**

**(Is it pen paper or online ?) online test**

**(Is there any coding round or only MCQ's ?) both but in different sections but in same round**

1st section C programming 25 ques 35 min .

2nd section Quants 16 ques 16 min.

3rd section Logical Aptitude 15 ques 14 min

4th section C programming 2 ques 60 min

different question set for each student,programming questions are also different.  
No switching is allowed between the question.

**CAN ANYONE ADD PROGRAMMING QUESTIONS OF CITICORP from IITD ??????**

### **Company : OPERA SOLUTIONS**

### **IIT Madras**

1. Test is written one and not an online test. It is conducted in two parts.
2. First part consists of 20 MCQ's - 30 min.f

3. Second part consists of 6 subjective questions - 45 min.

Part - I

Q1. Expected number of trials to get a 4 or 6 when a dice is thrown.

Q2. How many times does a minute hand cross over the hour hand in 24 hours?

Part-II

Q1. Given a set  $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ . Find two non-empty disjoint subsets A and B such that

- i)  $A \cup B = X$
- ii)  $\text{prod}(A)$  is divisible by  $\text{prod}(B)$ .  $\text{prod}(S)$  is the product of all the elements of set S.
- iii) The quotient obtained when  $\text{prod}(A)$  is divided by  $\text{prod}(B)$  is minimum.

Q2. There were 3 knobs for a lock A,B,C. Each can take 8 positions. When 2 of the knobs are at their correct positions, irrespective of the third, the lock opens. So the number of attempts to get it right will be  $8^{**}2=64$ . Can you do better than that?

Q3. There are 3 colors for a 9 digit lottery ticket. For a color to be of the same class all digits should be different from another one in that class. 122222222 is green, all 2 is red. Predict the colour of 123123123

Q4. Prove that  $nC7 - \text{floor}(n/7)$  is divisible by 7 for  $n > 7$ .

Q5. A man has 2 girlfriends. One lives in N and another in S. He has trains leaving in both directions in 1 hour interval. He wakes according to a RNG and takes 5 minutes to reach station and from there takes whichever train comes next. In a year he has visited the S gf a little over 300 times. How is this possible?

Q6. <http://vishnumenon.com/2013/08/13/to-catch-a-pirate/>

.. some one please elaborate questioM/s Strand Life Sciences, Karnataka will be visiting our campus to conduct the Written Test for BTech/Dual Degree/MTech – Computer Science & Engg as scheduled below:

Date : 29th November 2013

Time : 12.45 p.m. (Late comers will not be allowed in the Hall)

Venue : CRC

ns.. i do not remember exactly

## **IIT Kgp:**

exactly same as madras.

## **Company : Strand Life Sciences @IITD**

Duration : 90 minutes.

Paper pen test.

1.[5 Marks]

We are performing sum of individual digits for all number from 1 to 10,00,000

We have to find the no. of 1's and 2's obtained = **NO.s of 1 and 2 ????**

2.

One C-output question[5 Marks]

3.

Again C question, one code is given we have to find how many a and b pairs are possible.[5 Marks]

4.

One Reasoning question[5 Marks]

5.

which code runs faster in one array is accessed in row major order and in other array is accessed in column major order.[5 Marks]

6.

We have to derive the closed formulae for maximum no. of regions formed from n-lines.[15 Marks]

7.

Check two strings are anagrams or not.[15 Marks]

8.

N-queen problem code.[20 Marks]

9.

Nut bolt problem code.[30 Marks]

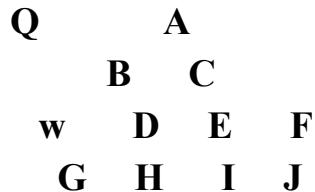
## IIT-B

Q write pseudocode for N-queen problem

Q after midnight, at what time, both hands of clock overlap.

Q Simulation of unbaised coin from biased

Q pseudo code for counting leaf nodes.



Where A, B, C, D,..... are numbers. Assume any DS and find path from top of triangle(i.e. A) to bottom row such that you can only move to number in bottom row to right or left of current node and sum is maximum.

Q  $T(n) = T(n-2) + T(n-1) + c$ , find complexity.

Q 4 people has to cross a bridge, only 2 ppl can cross the bridge in a single pass. 1 torch,

A=1min, B=3min, C=9min, D=11min. Find min time.

## Company Times Internet :-

Arbit

## Company HT Media @IITD:-

### PROBLEM STATEMENT:

Calculator Language (CL) supports assignment, positive and negative integers and simple arithmetic. The allowable characters in a CL statement are thus:

A..Z : Variables

0..9 : Digits

- + : Addition operator
- : Subtraction operator
- \* : multiplication operator
- / : integer division operator
- = : assignment operator
- () : brackets
- : negative sign

All operators have the same precedence and are right associative, thus  $15 - 8 - 3 = 15 - (8 - 3) = 10$ .

As one would expect, brackets will force the expression within them to be evaluated first. Brackets may be nested arbitrarily deeply. An expression never has two operators next to each other (even if separated by a bracket), an assignment operator is always immediately preceded by a variable and the leftmost operator on a line is always an assignment. For readability, spaces may be freely inserted into an expression, except between a negative sign and a number. A negative sign will not appear before a variable. All variables are initialised to zero (0) and retain their values until changed explicitly.

Write a program that will accept and evaluate expressions written in this language. Each expression occupies one line and contains at least one assignment operator, and maybe more.

### Input

Input will consist of a series of lines, each line containing a correct CL expression. No line will be longer than 100 characters. The file will be terminated by a line consisting of a single #.

### Output

Output will consist of a series of lines, one for each line of the input. Each line will consist of a list of the final values of all variables whose value changes as a result of the evaluation of that expression. If more than one variable changes value, they should be listed in alphabetical order, separated by commas. If a variable changes value more than once in an expression, only the

final value is output. A variable is said to change value if its value after the expression has been evaluated is different from its value before the expression was evaluated. If no variables change value, then print the message 'No Change'. Follow the format shown below exactly.

Sample input

```
A = B = 4
C = (D = 2)*_2
C = D = 2 * _2
F = C - D
E = D * _10
Z = 10 / 3
#
```

Sample output

```
A = 4, B = 4
C = -4, D = 2
D = -4
No Change
E = 40
Z = 3
```

Only one code was given and approximately 100 minutes are given to submit the code and allowed programming languages are C,Java,Python,Ruby.No compiler is provided we have to use our own compiler.

### **Company Dell @ IITD**

15 apti + 45 tech (75 min) - single choice correct --- Online test and all of us had the same sequence of questions :) and  
no negative marking

1. preorder and inorder are given.... find postorder
2. prefix to postfix expression

3. Shortest remaining time first question
4. 2 questions on page replacement strategy (one on LRU and other on optimal)
5. some ques on C
6. one ques on probability using bayes theorem
7. grapes - 74% water and dry grapes - 35% and of grapes are given.. how many dry grapes can be prepared ??
8. village population - 2500.... 65% are women of which 24% are literate.... 38% of villagers are literate. find % of men who are illiterate?
9. pipes P1 and P2 fills tank in 6min and 9min respectively. P3 can empty it in 3min. Starting with P1 nd P2 opened for 3 min. Then P3 also opened. How much time to take it to be emptied?
10. some ques on dbms.
11. networks also.
- 12.unix - zombie process,chmod recursively change permissions,hard link question

### **Company Cisco @ IITD-:**

20 apti + 30 tech (60 min) - single choice correct --- Pen & Paper test and all of us had the same sequence of questions :) and no negative marking..... tech ques involves both hardware and software.

1. 8 queens problem ---- Recursive

2. Venn diagram ques

3. Area of a circle ques

4. One ques on semaphore

5. Diff between PAM and AM

6. JK flip flop

7. hamming code

8. Boolean function

9. SUB B instruction of 8085

10. RST of 8085

### **Company NEC Corporation @IITD**

- 68 Personality based questions. Each involves 4 options and to tick most and least in yourself. No time limit. But average time to complete it is 20 min. So try to finish it within

20 min.

### **Company BrowserStack @IITD :- (it was online or paper pen ?????) - online**

Section 1.

Q1 parse and prettify html

given a single line input

input: <html><head><title>hello</title></head></html>

output: <html>

```
<head>
  <title>hello</title>
</head>
</html>
```

Q2 remove comments from c/c++

WAP to remove comments from c/c++ file

**(Can the comments be of both types,i.e., // and /\* \*/?)**

Section 2.

given a array of number

- . number within 1 to n. How u would sort them in following situations.
- a . all unique elements
- b. 1 repeated , 1 missing
- c 2 repeated 2 missing
- d. 4 repeated 4 missing+

Q3

given a NXN grid number of unique paths from left top to bottom right

Ans.  $(2n)!/(n! \times n!)$  (is it correct ?) //Yes: its  $2n$  Choose  $n$

### **Company SAP Labs @IITD:-**

Online test on mettl.com

Time:90 minutes

No negative marking

5 sections

1st: 10 Aptitude question

2nd: Analytical 15 question

3rd :Verbal 1 essay and 9 other question (Other as in what? Word meanings and stuff?)

4th :CS fundamentals 10 question

5th :Coding 1 question

Different question set for each students.

Was the coding question difficult?- moderate

Was it DP-based for the most of the people? - No

One Question was almost same to Problem 38 in Dynamic Programming ( Karumanchi )

What are the questions in **SAP @IITD?**

[\*\*fico,iit kgp\*\*](#)

**(15 aptitude,10programming, 2 general thinking)**

\*how many multiplications needed to compute  $x^{100}$  when product of two numbers can be saved into another variable at a time.

\*how many numbers within 200 can be listed such that no two distinct numbers are not divisible by one another??

Answers please???