TIFR-GS (CAM) Interview Experience by

Sayan Dutta

Hello readers. I am Parveen Chhikara. I am with an impressive Bengali guy, Sayan Dutta. He is currently at IIT Bombay, pursuing his masters.

I got in contact with him when he was active at Facebook & WhatsApp, helping students for their queries. At the first outset, I was impressed by his problem-solving skills along with his answers replied patiently.

Sayan appeared for TIFR GS-2016 (Integrated Ph.D. in mathematics) interview at Bengaluru. When I asked him to publish his interview experience, he readily agreed. Sayan explains nearly everything about his interview, in detail, which is really a thankful job. It would definitely help a lot of students.

Here is how, he says...

Hello everyone! I appeared for TIFR GS-2016 and I am willing to share my interview experience to help the future applicants. There were about 90 applicants shortlisted for the interview. The interview process lasted for 7 days with an average of 12 applicants per day. The reporting time was 9 am. Ten applicants were supposed to be present on my day.

I was one of the first ones to reach the institute. It is situated in a very calm and peaceful area and I must mention that the institute is squeaky clean and the architecture is awe-inspiring. You must try their canteen. It's extremely cheap and good. Now let's get to the actual thing.

It was the first interview of my life and I was both nervous and excited. There was one thing that was bothering me, the applicants immediately preceding and succeeding me were both from CMI, something quite bothersome. Still I was very confident. I had done enough hard work. I must mention **that it does not really matter from which institute you're**

from or how many topics you have learned in your UG course. <u>What matters is whether your concept in just a couple of them is crystal clear</u>. They don't expect you to solve world-class difficulty level problems. They only expect you to know what you're supposed to know after a standard UG course. Their main task is to observe that if you're stuck at a problem whether you can use their hints and solve it, i.e., whether you have the ability to be a researcher. So it eventually began. One by one the applicants were called., each interview taking approximately 25-30 minutes. I was one of the last candidates of that day, so I knew I would have to wait for quite long time. Eventually, my name was called at around 4.30 PM. So I had to wait for like 8 hours. I was quite exhausted and was having a mild headache. I entered the room for the first interview of my life. <u>The room was just like what you see the office meeting rooms in TV.</u> A long table with 7 professors sitting on the two sides. One madam and rest sirs.

L = lady professor, P_i = male professors, M = me ,

M : "May I come in ?"

P 1 : "Yes, yes. Come in."

I was tensed till now. But the moment I entered the room, it all disappeared.

L : "Good evening."

M : *Should have said that before* "Good evening teachers."

P2 : "Have you brought your certificates?"

M : "Yes sir."

Gave all the documents. (All professors were talking in a very sweet note)

L : "Ok Sayan. Tell us something about yourself."

M : "Maam. I'm Sayan Dutta. I'm from Kolkata. I'm a student of Jadavpur University and currently studying 3rd year BSc."

L : "Ok Sayan, what do you have in your last semester?"

M : "Ma'am, we have Ring theory, Differential Geometry…" paused for a moment, took a deep breath (well I must admit I was still a bit nervous) and then continued…

L : "Ok. What is your favourite topic?"

M : "Group Theory, Vector spaces."

L : "Analysis?"

M : "Real analysis" *well I didn't study metric spaces in depth*

L : "So shall we start with group theory?"

M : "yes ma'am"

P1 : "Ok Sayan. Take the marker and go to the board."

Yes you have to solve things on the board in an interview

P1 : "Write what I say otherwise you might miss something, ok?? Classify the groups for which Aut (G) is trivial"

M : *Thinks for a moment* ..."Sir G can be identity or a group of order 2"

P1 : *Gets excited.* "Yes!!! Can you prove it?"

M : "Sir if I take a cyclic group of order more than 2, then I can map one of the generators to another one and ..."

P1 : "Right! What about non-cyclic groups?"

M : *Thinks for some time*...

P1 : "Do you know about inner automorphism?"

M : "ohhoo...yes sir. Yes sir." *Does it for non-Abelian groups?*

P1 : "Good. What about Abelian groups?"

M : "Sir that is easy. I take the inverse map for those which does not have the order $2n$."

P1 : "Good. What about groups of type $\mathbb{Z}_2 + \mathbb{Z}_2 + \cdots + \mathbb{Z}_2$?"

M : *Thinks for some time* "Sir I can consider it to be a vector space, form a basis and then give the automorphism"

P1 : "Very good. Well done"

Those "good" did feel very nice and boosted my confidence

L : "Ok. So now what's next? Analysis?"

M : *Wish they had stayed with algebra* "Ok ma'am."

P2 : *Comes to the board and writes an integration. The thing I'm weakest at...Oh well*

$$\int_0^1 \frac{1}{[ax + (1-x)b]^2} \, dx$$

"Solve it."

M : *Solves it.* "The answer is $\frac{1}{ab}$."

P2 : "Yes. Now observe that the LHS is always positive but the RHS may be positive or negative, depending on a and b. where is the fallacy?"

M : *I was like what the hell.......Stuck for like 5 minutes*

P2 : "Does the integrand vanish anywhere?" *Doesn't give time to think. May be pissed at me.

Comes to the board and does the sum* "Well you see?? It vanishes at this point"

M : *sighed*

P2 : "What's next? Reimann integrals?"

M : *Why integration!!! Why not something else!!* "Sir actually I don't remember Reimann

integration"

An advice. If they ask from something which you are not confident with, immediately tell them. If you say that, it DOES NOT give you any negative marking

L : "Differentiation?? Continuity??"

M : "Yes ma'am. Only integration is a problem"

P3 : *Laughs.* "Ok. Sayan. Let's ask you about uniform continuity. "

Gives a function. Unfortunately I don't remember it

M : *Thinks for some time. Takes a couple of hints. Does it eventually.*

P1 : "Can you differentiate between continuity and uniform continuity geometrically??"

M : *Does it*

P3 : "When can you say that a continuous function is uniformly continuous? What extra condition?? Don't use epsilon delta"

M : *Thinks. Does it. May me right, may be wrong*

P4 : "Nice. Ok now, let's ask from linear algebra"

M : *Finally!!! Back to algebra!!! Takes a breath of relief*

P4 : "Suppose you have <u>a linear operator $T: \mathbb{R}^4 \to \mathbb{R}^2$, and $N(T) = \{...$*gives some vectors*$...\}$, what can</u> you say about its invertibility?"

M : *Tensed for some reason, does a blunder and says that it is invertible*

P4 : "Are you sure??? "

M : *Observes carefully and facepalm (I actually did that facepalm).* "Sorry sir. It is not. Explains to them."

P4 : "What relation holds between rank and nullity in case of finite dimensional vector spaces?"

M : *Says*

P4 : "Ok. (Asks other professors) Anything else??"

Everyone noded their head

L : "Ok Sayan. No more questions. Can you recall some of your university seniors who are studying or have studied here?? "

M : *Thinks.*

L : "No??"

M : "No ma'am but there were seniors who received the offer letter but didn't join"

L : "Who??"

M : *Says a couple of names.*

L : "So what do you want to study in the future??"

M : "Abstract algebra ma'am"

L : "Laughs. We don't teach abstract algebra here, you know??"

M : "……………….."

Wondering whether I had made the right decision of saying that. It actually slipped from my mouth. I knew they didn't teach algebra

M : *Tries to manage the situation* "Actually ma'am right now I can say that abstract algebra interests me a lot more than anything else. But I'm just a student of 3rd year of BSc. There might be changes in my interest. So I want to keep all options open"

P1 : "What other exams have you applied for??"

M : "JAM, ISI"

L : "Ok that will be all."

M : "Thank you teachers."

*Steps outside the room. Looks at the clock. They took my interview for 1 hour, almost twice of average. Didn't know whether that was good or bad.