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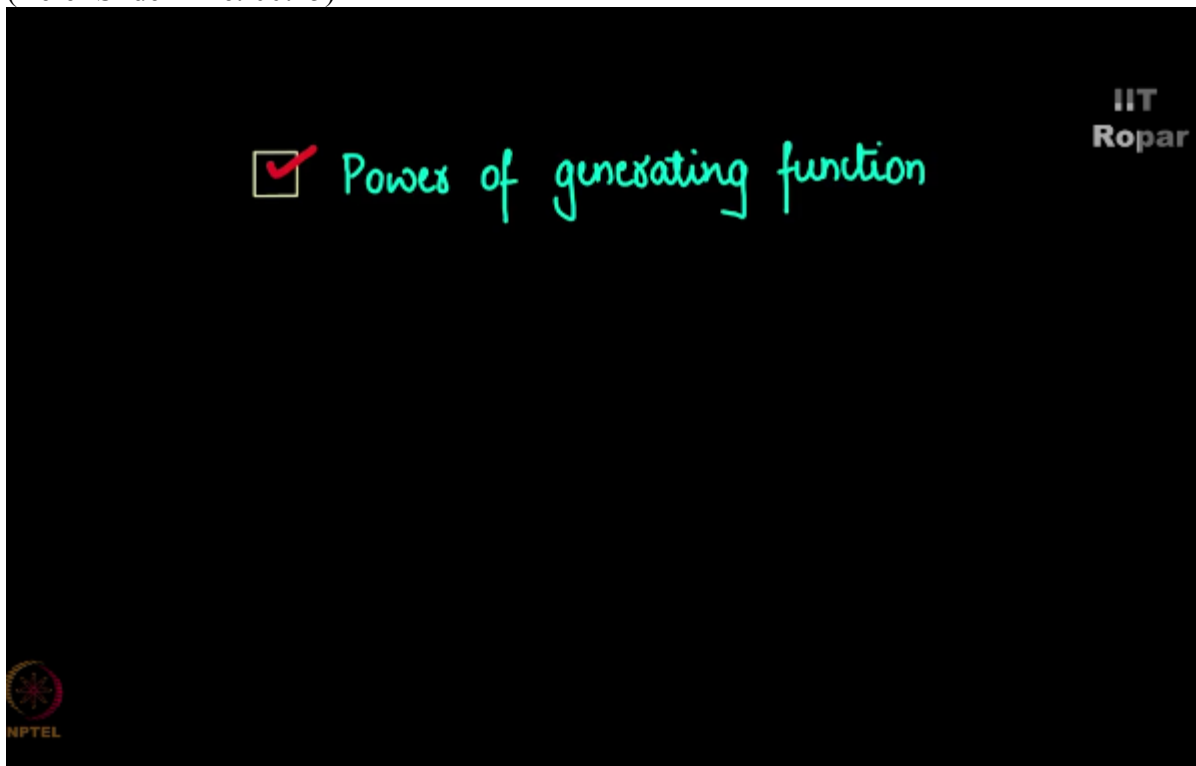
NPTEL ONLINE CERTIFICATION COURSE

**Discrete Mathematics
Graph Theory – 3 &
Generating Functions**

Why Generation function?

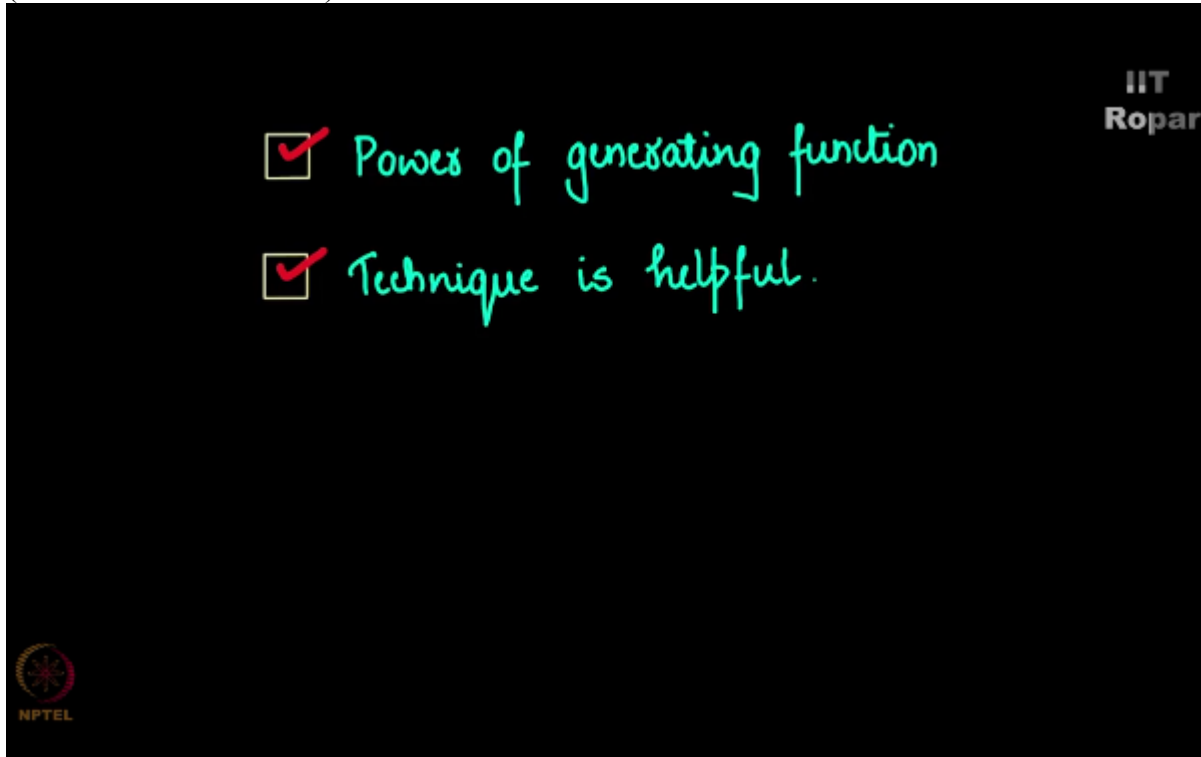
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Well the answer is simple, in math sometimes we use very hi-fi techniques to illustrate, illustrate the importance of the technique in solving a straightforward problem, (Refer Slide Time: 00:15)



when I give you a rifle and ask you to shoot at the dummy it doesn't mean the rifle is useless because it is not doing what it's supposed to do, because you're just shooting at the dumb target, right, rifle is not meant to do this, rifle is meant to do something else, but then I am just illustrating the power of a rifle here, the generating function concept that I explained came in used to you in solving a well-known problem, now this time we will see the power of generating functions which will help us in solving some non-trivial questions to, you must

observe that the technique is indeed powerful, a checklist here is do you understand the technique to solve a straightforward problem like the RGB question.
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Now a challenge for you all, remember the question, you should at least pick 1 red, 1 blue and 1 green question, now here it goes the question,
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- Powers of generating function
- Technique is helpful.
- Challenge : Can you pick 7 balls
of atleast 1R, 1B, 1G?

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can you pick 7 balls, by picking at least 1 red, at least 1 blue, at least 1 green, try solving this problem using the generating function technique that I told you, what is that?
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- Powers of generating function
- Technique is helpful.
- Challenge : Can you pick 7 balls
of atleast 1R, 1B, 1G?
Use generating functions.

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Expansion of X to the R in the, the coefficient of X to the R in the expansion of $1 - X$ whole to the $-N$, can you use that technique to solve this RGB problem with an extra restriction that you must pick 1 red, 1 green and 1 blue.

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