Syllabus for Computational Thinking recruitment test
IITM Online Degree Project

Course on computational thinking:

- Introduces students with no computing background to basic concepts in programming.
- Enables students to perform standard tasks like computing maximum, minimum, average on a dataset or on a subset that matches some criteria.
- Enables students to convert informal problem statements to formal criteria
- Teaches the importance of effective organization of data.
- Introduces students to formal notation for writing down and communicating computational procedures through flowcharts and pseudocode.

Topics:

- Counting and iteration: Variables to keep track of intermediate values
- Filtering and sanity of data: Idea of data types, allowed operations
- Different types of iteration: Filtering, multiple iterations, nested iterations
- Flowcharts and pseudocode. Patterns. procedures and parameters, polymorphism
- Data structures - lists: classroom data
- Data structures - graphs for relationships: e.g. shops and customers
- Data structures - trees: e.g. pronoun-to-noun matching in text
- Data structures - two dimensional arrays/matrices: e.g. train timetables
- Sorting, searching, indexing, hashing
- Recursion, divide and conquer.
- State: exploring states through BFS, DFS, backtracking.

Syllabus:
The syllabus for CT test will broadly cover the above topics. However, the questions may not strictly be from the above topics, instead will focus more on assessing the thinking process and the approach adopted by the candidate in order to solve a problem.