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# 7th Test Syllabus

**Active Date:** 13th Jul 2019, **Active till:** 1yr post subsc.

**Theme:** My progressive path.

## Topic #1 - Logic building for programming

- ✓ Solve problems logically with recursion.
- ✓ Solve problems logically with code reuse.
- ✓ Figure out the logic from a given set of programs.

## Topic #2 - Logical reasoning.

- ✓ Use logical connectives such negation, conjunction, disjunction, and material implication.
- ✓ Solve problems by applying pure binary logic and logical sequence & matching.

## **Topic #3 - Core computer science - Data structures.**

- ✓ Implement graph, matrix, and other advanced data structures through real-world coding challenges.
- ✓ Identify data structures in a given real-world application and understand their workings.
- ✓ Understand how a user-defined data structure can be created.

## **Topic #4 - Core computer science - Algorithms.**

- ✓ Solve problems involving tree or binary-search-based-tree algorithms.
- ✓ Solve problems involving graph algorithms.
- ✓ Analyze different algorithms and study their performance and optimization techniques.

## **Topic #5 - Core computer science - Dynamic programming.**

- ✓ Solve most popular dynamic programming problems such as dice throw, coin change, knapsack and the subset sum problem.
- ✓ Code dynamic programming challenges using recursion techniques.
- ✓ Code dynamic programming challenges using memoization techniques.
- ✓ Code dynamic programming challenges using tabulation techniques.
- ✓ Improve the time and memory complexity of a DP problem.

## Topic #6 - Core computer science - System design.

- ✓ Solve problems related to system interface definition.
- ✓ Answer problems related to back-of-the envelope calculation.
- ✓ Define data model of a software system.

## Topic #7 - High-order thinking.

- ✓ Use the knowledge level of bloom taxonomy and comprehend the knowledge to justify certain possibilities.
- ✓ Think of an application level from the knowledge and comprehension level of bloom taxonomy for the given case study

## Topic #8 - OS/DBMS/Networking

### OS:

1. Processes & Threads
2. Memory Management
3. Disk Management

### DBMS:

1. Minimisation of ER Diagram
2. ER Model: Generalisation, Specialisation and Aggregation
3. Scenario based DBMS exercise on real-world product

### NETWORKING:

1. Link, Point-to-point link, Subnet mask
2. VPN, NAT, RIP, NIC
3. Private IP addresses, Address sharing

## **Topic #9 - Tech interview round & tech puzzles.**

- ✓ Answer common technical questions asked from candidates' recent projects.
- ✓ Answer architecture-based questions concerning your views on performance and optimization.
- ✓ Solve a technical puzzle with pen and paper.
- ✓ Write a pseudocode for a given technical question or a technical programming puzzle.

## **Topic #10 - HR interview round & business puzzles.**

- ✓ Answer STAR-based questions asked by HR managers.
- ✓ Solve a business puzzle using pen and paper.