Useful Resources:

1. **Coding**

   a. https://leetcode.com/problemset/top-interview-questions/   start solving with easy one, then go for medium and if comfortable with medium solve few hard problems also.

   b.   Make a list of companies visiting our college like DEShaw ,Uber ,Visa, JPMC,Goldman Sachs,Myntra,Unacademy,Clumio,Microsoft,Amazon,Cisco,Arista Networks,Morgan Stanley etc.
   https://www.geeksforgeeks.org/must-coding-questions-company-wise/   solve problems from here company wise. Try to solve problems for those companies which are going to visit campus.

   c. For coding round practice, give Weekly and Biweekly contest on Leetcode and in case you missed it, try virtual participation. It will give you similar feelings of coding round conducted on campus by companies.
   Solve May Challenge problem on leetcode as you will get one new problem daily.

   d. For tree, stack,queue, linked list,graph solve problems from geeksforgeeks or leetcode(filter by tag) and most importantly know their applications. Many companies not directly ask the problem given on different websites but ask their applications.
   Few Examples:
   1. Applications of Postorder,Inorder,Preorder traversals.(They will not directly ask 3 liner solution).
   2. Application of Topological Sorting.(resolving dependencies).
   3. Application of Stack, Queue.

   These topics are very important **for Technical rounds.**

   Some other application based questions asked :

   1. https://stackoverflow.com/questions/6988611/sorting-10gb-data-in-1-gb-memory-how-will-i-do-it
   2. Hashmap vs Hashtable vs Hashset (those mentioning Java in resume).
   3. https://www.tutorialcup.com/interview/linked-list/delete-node-without-head.htm
   4. Data Structure used in Garbage Collector in Java.
   5. Data Structure used in LRU Cache Implementation.
   6. https://www.geeksforgeeks.org/design-a-data-structure-that-supports-insert-delete-search-and-getrandom-in-constant-time/
   7. https://www.geeksforgeeks.org/design-a-stack-that-supports-getmin-in-o1-time-and-o1-extra-space/

8. Data structure for implementing a debugger.
9. **Trie** Data structure. (Vimp) → google autocomplete feature.
10. https://www.geeksforgeeks.org/implement-a-dictionary-using-trie/ (Imp)

2. Technical (from GfG)

a. OOPS in Java or C++ from geeksforgeeks. If going for Java, don't forget to learn about differences in C++ and Java OOPS.
b. Is call by reference there in Java ? (same for c++)
c. Is Operator Overloading supported in Java?
d. Is C++ totally object oriented? (same for Java)
e. Difference between Interface and Abstract Class in Java ? (Very famous, try to know this in detail).
f. How will you implement Abstraction and Interface in C++.
g. Virtual Inheritance, pure virtual inheritance.
h. Virtual Constructor & virtual Destructor(its use).
i. Can constructor be private ? Same for destructor.
j. Dangling pointer. (only in DE Shaw).
k. Why C++ not provide specifically Garbage Collector as in Java.
l. **static** keyword**.**
m. Can you give an example where **finally** block will not be executed ?
n. Shallow Copy vs Deep Copy.
o. VTABLE, VPTR. (vimp).
p. malloc() vs new.
q. delete vs free.
r. Overriding vs Overloading.(Runtime vs compile time polymorphism).
s. Association, Composition and Aggregation. (When these are present why we need Inheritance).
t. Disadvantage of Inheritance.
u. Singleton Class.
v. What if there is an exception in catch/finally block?
w. Thread in Java. (Will be asked if you have used in your project).
x. Mutable vs immutable class. Ex : String is immutable.
y. Working of Garbage Collector.
z. JDK, JRE, JVM. (Imp)
aa. Working of JVM.
bb. Why main method is static.
cc. Explain each term in line **public void static main(String args[]).**
dd. **Friend** Class/Function in C++.
ee. Structure vs Class.
ff. Advantages of BST over Hash table.

gg. https://www.geeksforgeeks.org/add-two-numbers-without-using-arithmetic-operators/

hh. Operator overloading in C++.

● C++ peeps, most of questions are related to **virtual** keyword**.**

3. Operating System

https://www.geeksforgeeks.org/last-minute-notes-operating-systems/ go through this 4 to 5 days before beginning of your placement session.

a. If you love learning through watching videos, watch OS course by Sanchit Jain on youtube.

b. If you love reading, source (GfG), mentioning only important topics.(https://www.geeksforgeeks.org/operating-systems/)

- Intro to OS.
- Real Time OS, Multiprogramming OS, Distributed OS(What are they,no need to go in detail).
- Multitasking, Multithreading and Multiprocessing.
- Process, States of Process, PCB(Process Control Block).
- Process Scheduler(Short,Medium,Long term).
- CPU Scheduling Algo. (Round Robin is imp).
- Belady's Anomaly. (Vimp)
- Starvation and Aging. (Vimp)
- Process Synchronization, Critical Section.
- Mutex vs Semaphore. (Vimp)
- Reader Writer/Producer Consumer/Philosopher Problem.
- Deadlock vs Livelock. (Vimp)
- Deadlock Prevention vs Avoidance.

  Many companies ask problems on Memory Management, if possible, study these topics in detail, watch Sanchit Jain video (in case finding any difficulty).
  - Memory Hierarchy.
  - Where local variables, dynamically allocated variables are saved? And how it is stored and retrieved.
  - Partition Allocation Method.

- Best fit/Worst fit/First fit.
- Virtual Memory. (Favorite ques)
- Paging/Segmentation.
- Page Fault.
- Thrashing. (Favorite Question).
- LRU Cache.
- Secondary Memory.
- Stack vs Heap.

4. DBMS

https://www.geeksforgeeks.org/last-minute-notes-dbms/   go through this 4 to 5 days
before beginning of your placement session.

a. ER diagram symbols.
b. Generalization, Specialization, Aggregation.
c. Writing queries.
d. Having vs Where Clause.
e. Keys (Primary,Super,Candidate,Foreign).   (V imp)
f. Natural Join vs Inner Join.
g. Practice queries on join.   (few problems from your lab assignment).
h. Normalization (till BCNF form).   (Vimp)
i. Practice few questions on Normalizing a given table to BCNF form.
j. Identifying form of given table.
k. ACID properties. (Favorite ques)
l. Concurrency control and its protocols. (protocols are not asked but just give a read)
m. Dirty Read. (V imp)
n. Serializability. (just give a reading)
o. Indexing and its Types.

5. Computer Networks (Ravindrababu Ravula's videos are very helpful).

a. What will happen when you hit "www.google.com" ? (V Imp) → will cover many of your topics.
b. OSI layer model.
c. TCP/IP layer model.
d. Application Layer: HTTP, FTP, DNS, Proxy Server, SMTP.
e. How DHCP works ?
f. connection oriented vs connectionless and its example.
g. TCP vs UDP. (I think only Cisco ask in detail about their header and all)
h. TCP - 3 way handshake. (Imp)
i. Where UDP is used.

j. Classful vs Classless IP.
k. VLSM,CIDR,Subnetting.
l. NAT (N/w address translation) and how it is useful.
m. Working of ARP.

6. System Design

https://github.com/kartikMahendru/System-Design-Resources

Thanks to Kartik Mahendru for this, I personally find it very useful.

Personal Experience:

- Make notes of things you are reading and learning. It will be very helpful for you at last moment.
- For coding, first try to solve the problem by yourself. Set timer (lets say 20 min for easy problem), try to solve it, even come up with brute force solution, in case not able to solve it, open solution go through the algo, understand it and again try to implement. Please don't copy/paste the solution, you are not competing with anyone at time you are solving,competition will begin once your placement session will start.
- Don't be frustrated, if not able to solve the problem, just keep trying, withing a week you will observe the difference. Just keep PRACTICING.
- For OS,DBMS,N/ws and OOPS read it once now and make notes of it. Revise it 4 or 5 days before your session starts.
- **Read interview Experience given of GfG of various companies visiting our campus, it will give you an idea of pattern they follow.** (V imp)
- Don't panic while you are going for coding round in CC or CSED. Don't allow your mind to come with thoughts like …. "abey ye coder log sab de rhe, sab faad log hai abhi toh, mera kaise hoga jab tak ye bache hai". If you are allowing your mind to think all this, "aadhi jung vahi haar jaa rhe apan".

During your preparation, feel free to ping any of your seniors in case of any doubts or for any help.

ALL THE BEST !!!!

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