

COMPLETE INTERVIEW MATERIAL:

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1) What are the differences between C++ and Java ?

Platform-independent	C++ is platform-dependent.	Java is platform-independent.
Mainly used for	C++ is mainly used for system programming.	Java is mainly used for application programming. It is widely used in window, web-based, enterprise and mobile applications.
Design Goal	C++ was designed for systems and applications programming. It was an extension of C programming language .	Java was designed and created as an interpreter for printing systems but later extended as a support network computing. It was designed with a goal of being easy to use and accessible to a broader audience.
Goto	C++ supports the goto statement.	Java doesn't support the goto statement.
Multiple inheritance	C++ supports multiple inheritance.	Java doesn't support multiple inheritance through class. It can be achieved by interfaces in java .
Operator Overloading	C++ supports operator overloading .	Java doesn't support operator overloading.
Pointers	C++ supports pointers . You can write pointer program in C++.	Java supports pointer internally. However, you can't write the pointer program in java. It means java has restricted pointer support in java.
Compiler and Interpreter	C++ uses compiler only. C++ is compiled and run using the compiler which converts source code into machine	Java uses compiler and interpreter both. Java source code is converted into bytecode at compilation time. The interpreter executes this bytecode at runtime and produces output. Java is interpreted that is why it is platform independent.

		code so, C++ is platform dependent.	
	Call by Value and Call by reference	C++ supports both call by value and call by reference.	Java supports call by value only. There is no call by reference in java.
	Structure and Union	C++ supports structures and unions.	Java doesn't support structures and unions.
	Thread Support	C++ doesn't have built-in support for threads. It relies on third-party libraries for thread support.	Java has built-in thread support.
	Documentation comment	C++ doesn't support documentation comment.	Java supports documentation comment (/** ... */) to create documentation for java source code.
	Virtual Keyword	C++ supports virtual keyword so that we can decide whether or not override a function.	Java has no virtual keyword. We can override all non-static methods by default. In other words, non-static methods are virtual by default.
	unsigned right shift >>>	C++ doesn't support >>> operator.	Java supports unsigned right shift >>> operator that fills zero at the top for the negative numbers. For positive numbers, it works same like >> operator.
	Inheritance Tree	C++ creates a new inheritance tree always.	Java uses a single inheritance tree always because all classes are the child of Object class in java. The object class is the root of the inheritance tree in java.
	Hardware	C++ is nearer to hardware.	Java is not so interactive with hardware.

Object-oriented

C++ is an object-oriented language. However, in C language, single root hierarchy is not possible.

Java is also an object-oriented language. However, everything (except fundamental types) is an object in Java. It is a single root hierarchy as everything gets derived from `java.lang.Object`.

2) What are the features of Java Programming Language?

There are the following features in Java Programming Language.

- **Simple:** Java is easy to learn. The syntax of Java is based on C++ which makes easier to write the program in it.
- **Object-Oriented:** Java follows the object-oriented paradigm which allows us to maintain our code as the combination of different type of objects that incorporates both data and behaviour.
- **Portable:** Java supports read-once-write-anywhere approach. We can execute the Java program on every machine. Java program (.java) is converted to bytecode (.class) which can be easily run on every machine.
- **Platform Independent:** Java is a platform independent programming language. It is different from other programming languages like C and C++ which needs a platform to be executed. Java comes with its platform on which its code is executed. Java doesn't depend upon the operating system to be executed.
- **Secured:** Java is secured because it doesn't use explicit pointers. Java also provides the concept of Byte Code and Exception handling which makes it more secured.
- **Robust:** Java is a strong programming language as it uses strong memory management. The concepts like Automatic garbage collection, Exception handling, etc. make it more robust.
- **Architecture Neutral:** Java is architectural neutral as it is not dependent on the architecture. In C, the size of data types may vary according to the architecture (32 bit or 64 bit) which doesn't exist in Java.

- **Interpreted:** Java uses the Just-in-time (JIT) interpreter along with the compiler for the program execution.
- **High Performance:** Java is faster than other traditional interpreted programming languages because Java bytecode is "close" to native code. It is still a little bit slower than a compiled language (e.g., C++).
- **Multithreaded:** We can write Java programs that deal with many tasks at once by defining multiple threads. The main advantage of multi-threading is that it doesn't occupy memory for each thread. It shares a common memory area. Threads are important for multi-media, Web applications, etc.
- **Distributed:** Java is distributed because it facilitates users to create distributed applications in Java. RMI and EJB are used for creating distributed applications. This feature of Java makes us able to access files by calling the methods from any machine on the internet.
- **Dynamic:** Java is a dynamic language. It supports dynamic loading of classes. It means classes are loaded on demand. It also supports functions from its native languages, i.e., C and C++.

3) What is JVM ?

Java Virtual Machine is a virtual machine that enables the computer to run the Java program. JVM acts like a run-time engine which calls the main method present in the Java code. JVM is the specification which must be implemented in the computer system. The Java code is compiled by JVM to be a Bytecode which is machine independent and close to the native code.

4) What is JIT Compiler ?

Just-In-Time(JIT) compiler: It is used to improve the performance. JIT compiles parts of the bytecode that have similar functionality at the same time, and hence reduces the amount of time needed for compilation. Here the term "compiler" refers to a translator from the instruction set of a Java virtual machine (JVM) to the instruction set of a specific CPU.

5) What are the different access specifiers in Java ?

In Java, access specifiers are the keywords which are used to define the access scope of the method, class, or a variable. In Java, there are four access specifiers given below.

- **Public:** The classes, methods, or variables which are defined as public, can be accessed by any class or method.
- **Protected:** Protected can be accessed by the class of the same package, or by the sub-class of this class, or within the same class.
- **Default:** Default are accessible within the package only. By default, all the classes, methods, and variables are of default scope.
- **Private:** The private class, methods, or variables defined as private can be accessed within the class only.

6) What is the difference between an object-oriented programming language and object-based programming language?

There are the following basic differences between the object-oriented language and object-based language.

- Object-oriented languages follow all the concepts of OOPs whereas, the object-based language doesn't follow all the concepts of OOPs like inheritance and polymorphism.
- Object-oriented languages do not have the inbuilt objects whereas Object-based languages have the inbuilt objects, for example, JavaScript has window object.
- Examples of object-oriented programming are Java, C#, Smalltalk, etc. whereas the examples of object-based languages are JavaScript, VBScript, etc.

7) What are the features of OOP?

The important features of Object-Oriented programming are:

- **Classes and Objects**

These contain data and functions bundled together under a unit. In other words, class is a collection of similar objects. When we define a class it just creates template or Skelton. So no memory is created when class is created. Memory is occupied only by object.

Example:

```
Class className
{
    Data
    Functions
};
main ( )
{
    className objectname1,objectname2,...;
}
```

In other words classes acts as data types for objects.

Objects are the instances of a class.

- **Inheritance**

Inheritance is an important pillar of OOP(Object Oriented Programming). It is the mechanism in java by which one class is allow to inherit the features(fields and methods) of another class.

- **Polymorphism**

The word polymorphism means having many forms. In simple words, we can define polymorphism as the ability of a message to be displayed in more than one form.

- **Data Abstraction**

Abstraction means displaying only essential information and hiding the details. Data abstraction refers to providing only essential information about the data to the outside world, hiding the background details or implementation.

- **Data Encapsulation**

Encapsulation is defined as wrapping up of data and information under a single unit. In Object-Oriented Programming, Encapsulation is defined as binding together the data and the functions that manipulate them.

- **Dynamic Binding**

In dynamic binding, the code to be executed in response to function call is decided at runtime.

- **Message Passing**

Objects communicate with one another by sending and receiving information to each other. A message for an object is a request for execution of a procedure and therefore will invoke a function in the receiving object that generates the desired results. Message passing involves specifying the name of the object, the name of the function and the information to be sent.

8) What is Inline function?

Inline function is a technique used by the compilers and instructs to insert complete body of the function wherever that function is used in the program source code.

9) What is an abstract class?

An abstract class is a class which cannot be instantiated. Creation of an object is not possible with abstract class but it can be inherited. An abstract class can contain only Abstract method. Java allows only abstract method in abstract class while for other language it allows non-abstract method as well.

10) What is an abstract class?

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11) What is an interface ?

An interface is a collection of abstract method. If the class implements an inheritance, and then thereby inherits all the abstract methods of an interface.

12) What is exception handling ?

Exception is an event that occurs during the execution of a program. Exceptions can be of any type — Run time exception, Error exceptions. Those exceptions are handled properly through exception handling mechanism like try, catch and throw keywords.

13) What is static and dynamic binding ?

Binding is nothing but the association of a name with the class. Static binding is a binding in which name can be associated with the class during compilation time and it is also called as early Binding.

Dynamic binding is a binding in which name can be associated with the class during execution time and it is also called as Late Binding.

14) What is a copy constructor ?

This is a special constructor for creating a new object as a copy of an existing object. There will be always only one copy constructor that can be either defined by the user or the system.

15) What is the difference between a structure and a class ?

Structure default access type is public but class access type is private. A structure is used for grouping data whereas class can be used for grouping data and methods. Structures are exclusively used for data and it doesn't require strict validation but classes are used to encapsulates and inherit data which requires strict validation.

16) Why is C known as the Mother Language ?

C is known as a mother language because most of the compilers and JVMs are written in C language. Most of the languages which are developed after C language has borrowed heavily

from it like C++, Python, Rust, JavaScript, etc. It introduces new core concepts like arrays, functions, file handling which are used in these languages.

17) What are the differences between Local Variables and Global Variables?

Basis for comparison	Local variable	Global variable
Declaration	A variable which is declared inside function or block is known as a local variable.	A variable which is declared outside function or block is known as a global variable.
Scope	The scope of a variable is available within a function in which they are declared.	The scope of a variable is available throughout the program.
Access	Variables can be accessed only by those statements inside a function in which they are declared.	Any statement in the entire program can access variables.
Life	Life of a variable is created when the function block is entered and destroyed on its exit.	Life of a variable exists until the program is executing.
Storage	Variables are stored in a stack unless specified.	The compiler decides the storage location of a variable.

18) What is the use of writing a function in C Programming Language?

- C functions are used to avoid the rewriting the same code again and again in our program.
- C functions can be called any number of times from any place of our program.
- When a program is divided into functions, then any part of our program can easily be tracked.

- C functions provide the reusability concept, i.e., it breaks the big task into smaller tasks so that it makes the C program more understandable.

19) What is the difference between Call By Value and Call By Reference?

Call by value	Call by reference	
Description	When a copy of the value is passed to the function, then the original value is not modified.	When a copy of the value is passed to the function, then the original value is modified.
Memory location	Actual arguments and formal arguments are created in separate memory locations.	Actual arguments and formal arguments are created in the same memory location.
Safety	In this case, actual arguments remain safe as they cannot be modified.	In this case, actual arguments are not reliable, as they are modified.
Arguments	The copies of the actual arguments are passed to the formal arguments.	The addresses of actual arguments are passed to their respective formal arguments.

20) What is recursion in C ?

When a function calls itself, and this process is known as recursion. The function that calls itself is known as a recursive function.

Recursive function comes in two phases:

Winding phase: When the recursive function calls itself, and this phase ends when the condition is reached.

Unwinding phase: Unwinding phase starts when the condition is reached, and the control returns to the original call.

21) What is a pointer in C?

A pointer is a variable that refers to the address of a value. It makes the code optimized and makes the performance fast. Whenever a variable is declared inside a program, then the system allocates some memory to a variable. The memory contains some address number. The variables that hold this address number is known as the pointer variable.

22) What is a NULL pointer ?

A pointer that doesn't refer to any address of value but NULL is known as a NULL pointer. When we assign a '0' value to a pointer of any type, then it becomes a Null pointer.

23) What is a far pointer in C ?

A pointer which can access all the 16 segments (whole residence memory) of RAM is known as far pointer. A far pointer is a 32-bit pointer that obtains information outside the memory in a given section.

24) What is a dangling pointer in C ?

- If a pointer is pointing any memory location, but meanwhile another pointer deletes the memory occupied by the first pointer while the first pointer still points to that memory location, the first pointer will be known as a dangling pointer. This problem is known as a dangling pointer problem.
- Dangling pointer arises when an object is deleted without modifying the value of the pointer. The pointer points to the deallocated memory.

25) What is the usage of Pointer in C ?

- Accessing array elements: Pointers are used in traversing through an array of integers and strings. The string is an array of characters which is terminated by a null character '\0'.

- Dynamic memory allocation: Pointers are used in allocation and deallocation of memory during the execution of a program.
- Call by Reference: The pointers are used to pass a reference of a variable to other function.
- Data Structures like a tree, graph, linked list, etc.: The pointers are used to construct different data structures like tree, graph, linked list, etc.

26) What is Static Memory Allocation ?

- In case of static memory allocation, memory is allocated at compile time, and memory can't be increased while executing the program. It is used in the array.
- The lifetime of a variable in static memory is the lifetime of a program.
- The static memory is allocated using static keyword.
- The static memory is implemented using stacks or heap.
- The pointer is required to access the variable present in the static memory.
- The static memory is faster than dynamic memory.
- In static memory, more memory space is required to store the variable.

27) What is Dynamic Memory Allocation ?

- In case of dynamic memory allocation, memory is allocated at runtime and memory can be increased while executing the program. It is used in the linked list.
- The malloc() or calloc() function is required to allocate the memory at the runtime.
- An allocation or deallocation of memory is done at the execution time of a program.
- No dynamic pointers are required to access the memory.
- The dynamic memory is implemented using data segments.
- Less memory space is required to store the variable.

28) What is a structure ?

- The structure is a user-defined data type that allows storing multiple types of data in a single unit. It occupies the sum of the memory of all members.
- The structure members can be accessed only through structure variables.

- Structure variables accessing the same structure but the memory allocated for each variable will be different.

29) What is a union ?

- The union is a user-defined data type that allows storing multiple types of data in a single unit. However, it doesn't occupy the sum of the memory of all members. It holds the memory of the largest member only.
- In union, we can access only one variable at a time as it allocates one common space for all the members of a union.

30) What is an auto keyword in C ?

In C, every local variable of a function is known as an automatic (auto) variable. Variables which are declared inside the function block are known as a local variable. The local variables are also known as an auto variable. It is optional to use an auto keyword before the data type of a variable. If no value is stored in the local variable, then it consists of a garbage value.

31) What is a token ?

The Token is an identifier. It can be constant, keyword, string literal, etc. A token is the smallest individual unit in a program. C has the following tokens:

Identifiers: Identifiers refer to the name of the variables.

Keywords: Keywords are the predefined words that are explained by the compiler.

Constants: Constants are the fixed values that cannot be changed during the execution of a program.

Operators: An operator is a symbol that performs the particular operation.

Special characters: All the characters except alphabets and digits are treated as special characters.

32) What is command line argument ?

The argument passed to the main() function while executing the program is known as command line argument. For example:

```
main(int count, char *args[])
{
    //code to be executed
}
```

33) What is a file?

A file is a named location which stores data or information permanently. A file is always stored inside a storage device using file name (e.g. STUDENT.MARKS). A file name normally has primary and secondary name separated by a "." (DOT).

34) What is the difference between Function Overloading and Overriding ?

Overloading is when two or more methods in the same class have the same method name but different parameters (i.e. different method signatures).

Overriding is when two methods having the same method name and parameters (i.e., method signature) but one of the methods is in the parent class and the other is in the child class.

35) What is a deadlock in OS ?

Deadlock is a situation or condition where the two processes are waiting for each other to complete so that they can start. This results in both the processes hanging.

36) What is Context Switching ?

Transferring the control from one process to another process requires saving the state of the old process and loading the saved state for the new process. This task is known as context switching.

37) Differentiate between Compiler and Interpreter.

An interpreter reads one instruction at a time and carries out the actions implied by that instruction. It does not perform any translation. But a compiler translates the entire instructions.

38) What are the differences between list and tuple in Python ?

LIST	TUPLES
Lists are mutable i.e they can be edited.	Tuples are immutable (tuples are lists which can't be edited).
Lists are slower than tuples.	Tuples are faster than list.
Syntax: list_1 = [10, 'Chelsea', 20]	Syntax: tup_1 = (10, 'Chelsea' , 20)

39) What type of language is Python ? Scripting or Programming ?

Python is capable of scripting, but in general sense, it is considered as a general-purpose programming language.

40) What is type conversion in Python ?

Type conversion refers to the conversion of one data type into another.

int() – converts any data type into integer type

float() – converts any data type into float type

ord() – converts characters into integer

hex() – converts integers to hexadecimal

oct() – converts integer to octal

tuple() – This function is used to convert to a tuple.

set() – This function returns the type after converting to set.

list() – This function is used to convert any data type to a list type.

dict() – This function is used to convert a tuple of order (key,value) into a dictionary.

str() – Used to convert integer into a string.

complex(real,imag) – This function converts real numbers to complex(real,imag) number.

41) What is pickling and unpickling in Python ?

Pickle module accepts any Python object and converts it into a string representation and dumps it into a file by using dump function, this process is called pickling. While the process of retrieving original Python objects from the stored string representation is called unpickling.

42) How to comment multiple lines in Python ?

Multi-line comments appear in more than one line. All the lines to be commented are to be prefixed by a #. You can also a very good shortcut method to comment multiple lines. All you need to do is hold the ctrl key and left click in every place wherever you want to include a # character and type a # just once. This will comment all the lines where you introduced your cursor.

43) What are docstrings in Python ?

Docstrings are not actually comments, but, they are documentation strings. These docstrings are within triple quotes. They are not assigned to any variable and therefore, at times, serve the purpose of comments as well.

44) What is a dictionary in Python ?

The built-in datatypes in Python is called dictionary. It defines one-to-one relationship between keys and values. Dictionaries contain pair of keys and their corresponding values. Dictionaries are indexed by keys.

45) What advantages do NumPy arrays offer over (nested) Python lists?

- Python's lists are efficient general-purpose containers. They support (fairly) efficient insertion, deletion, appending, and concatenation, and Python's list comprehensions make them easy to construct and manipulate.
- They have certain limitations: they don't support "vectorized" operations like elementwise addition and multiplication, and the fact that they can contain objects of differing types mean that Python must store type information for every

element, and must execute type dispatching code when operating on each element.

- NumPy is not just more efficient; it is also more convenient. You get a lot of vector and matrix operations for free, which sometimes allow one to avoid unnecessary work. And they are also efficiently implemented.
- NumPy array is faster and You get a lot built in with NumPy, FFTs, convolutions, fast searching, basic statistics, linear algebra, histograms, etc.

46) Does Python have OOPS Concept ?

Python is an object-oriented programming language. This means that any program can be solved in python by creating an object model. However, Python can be treated as procedural as well as structural language.

47) What is __init__?

`__init__` is a method or constructor in Python. This method is automatically called to allocate memory when a new object/ instance of a class is created. All classes have the `__init__` method.

48) What is meant by Database ?

In simple terms, Database is a collection of data in some organized way to facilitate its user's to easily access, manage and upload the data.

49) What are the advantages of DBMS ?

- **Controlled Redundancy:** DBMS supports a mechanism to control redundancy of data inside the database by integrating all the data into a single database and as data is stored at only one place, the duplicity of data does not happen.
- **Data Sharing:** Sharing of data among multiple users simultaneously can also be done in DBMS as the same database will be shared among all the users and by different application programs.

- **Backup and Recovery Facility:** DBMS minimizes the pain of creating the backup of data again and again by providing a feature of 'backup and recovery' which automatically creates the data backup and restores the data whenever required.
- **Enforcement of Integrity Constraints:** Integrity Constraints are very important to be enforced on the data so that the refined data after putting some constraints are stored in the database and this is followed by DBMS.
- **Independence of Data:** It simply means that you can change the structure of the data without affecting the structure of any of the application programs.

50) What is the use of Normalization in DBMS ?

Normalization is the process of analyzing the relational schemas which are based on their respective functional dependencies and the primary keys in order to fulfill certain properties.

The properties include:

- To minimize the redundancy of the Data.
- To minimize the Insert, Delete and Update Anomalies.

51) What are the differences between Primary Key and Unique Key ?

- The main difference between the Primary key and Unique key is that the Primary key can never have a null value while the Unique key may consist of null value.
- In each table, there can be only one primary key while there can be more than one unique key in a table.

52) Explain ACID properties in DBMS.

- **Atomicity:** This is based on the concept of "either all or nothing" which basically means that if any update occurs inside the database then that update should either be available to all the others beyond user and application program or it should not be available to anyone beyond the user and application program.
- **Consistency:** This ensures that the consistency is maintained in the database before or after any transaction that takes place inside the database.

- **Isolation:** As the name itself suggests, this property states that each transaction that is occurring is in isolation with others i.e. a transaction which has started but not yet completed should be in isolation with others so that the other transaction does not get impacted with this transaction.
- **Durability:** This property states that the data should always be in a durable state i.e. any data which is in the committed state should be available in the same state even if any failure or restart occurs in the system.

53) Explain Entity, Entity Type, and Entity Set in DBMS?

- Entity is an object, place or thing which has its independent existence in the real world and about which data can be stored in a database. Eg: any person, book, etc.
- Entity Type is a collection of the entities which have the same attributes. Eg: STUDENT table contains rows in which each row is an entity holding attributes like name, age, and id of the students, hence STUDENT is an Entity Type which holds the entities having same attributes.
- Entity Set is a collection of the entities of the same type. Eg: A collection of the employees of a firm.

54) What are the different levels of abstraction in DBMS ?

There are 3 levels of data abstraction in the DBMS.

- **Physical Level:** This is the lowest level of the data abstraction which states how the data is stored in the database.
- **Logical Level:** This is the next level of the data abstraction which states the type of the data and the relationship among the data that is stored in the database.
- **View Level:** This is the highest level in the data abstraction which shows/states only a part of the database.

55) What is a functional dependency in DBMS ?

This is basically a constraint which is useful in describing the relationship among the different attributes in a relation.

Example: If there is some relation 'R1' which has 2 attributes as Y and Z then the functional dependency among these 2 attributes can be shown as $Y \rightarrow Z$ which states that Z is functionally dependent on Y.

56) How is pattern matching done in SQL ?

With the help of the LIKE operator, pattern matching is possible in the SQL. '%' is used with the Like operator when it matches with the 0 or more characters and '_' is used to match the one particular character.

Example:

- select * from Emp where name like 'b%'
- select * from Emp where name like 'hans_'

57) What are the different types of relationships in RDBMS ?

One-to-One: This basically states that there should be a one-to-one relationship between the tables i.e. there should be one record in both the tables. Eg: Among a married couple, both wife and husband can have only one spouse.

One-to-Many: This states that there can be many relationships for one i.e. a primary key table hold only one record which can have many, one or none records in the related table. Eg: A Mother can have many children.

Many-to-Many: This states that both the tables can be related to many other tables. Eg: One can have many siblings and so do they have.

58) What is data structure?

Data structure refers to the way data is organized and manipulated. It seeks to find ways to make data access more efficient. When dealing with the data structure, we not only focus on one piece of data but the different set of data and how they can relate to one another in an organized manner.

59) Differentiate between file and structure storage structure.

The key difference between both the data structure is the memory area that is being accessed. When dealing with the structure that resides the main memory of the computer system, this is referred to as storage structure. When dealing with an auxiliary structure, we refer to it as file structures.

60) When is a binary search best applied?

A binary search is an algorithm that is best applied to search a list when the elements are already in order or sorted. The list is searched starting in the middle, such that if that middle value is not the target search key, it will check to see if it will continue the search on the lower half of the list or the higher half. The split and search will then continue in the same manner.

61) What is a linked list?

A linked list is a sequence of nodes in which each node is connected to the node following it. This forms a chain-like link for data storage.

62) How do you reference all the elements in a one-dimension array?

To reference all the elements in a one -dimension array, you need to use an indexed loop, So that, the counter runs from 0 to the array size minus one. In this manner, You can reference all the elements in sequence by using the loop counter as the array subscript.

63) In what areas do data structures are applied?

Data structures are essential in almost every aspect where data is involved. In general, algorithms that involve efficient data structure is applied in the following areas:

numerical analysis, operating system, A.I., compiler design, database management, graphics, and statistical analysis, to name a few.

64) What is LIFO?

LIFO is a short form of Last In First Out. It refers how data is accessed, stored and retrieved. Using this scheme, data that was stored last should be the one to be extracted first. This also means that in order to gain access to the first data, all the other data that was stored before this first data must first be retrieved and extracted.

65) What is a queue?

A queue is a data structure that can simulate a list or stream of data. In this structure, new elements are inserted at one end, and existing elements are removed from the other end.

66) What are binary trees?

A binary tree is one type of data structure that has two nodes, a left node, and a right node. In programming, binary trees are an extension of the linked list structures.

67) Which data structures are applied when dealing with a recursive function?

Recursion, is a function that calls itself based on a terminating condition, makes use of the stack. Using LIFO, a call to a recursive function saves the return address so that it knows how to return to the calling function after the call terminates.

68) What is a stack?

A stack is a data structure in which only the top element can be accessed. As data is stored in the stack, each data is pushed downward, leaving the most recently added data on top.

69) Explain Binary Search Tree

A binary search tree stores data in such a way that they can be retrieved very efficiently. The left subtree contains nodes whose keys are less than the node's key value, while the right subtree contains nodes whose keys are greater than or equal to the node's key value. Moreover, both subtrees are also binary search trees.

70) What are multidimensional arrays?

Multidimensional arrays make use of multiple indexes to store data. It is useful when storing data that cannot be represented using single dimensional indexing, such as data representation in a board game, tables with data stored in more than one column.

71) Are linked lists considered linear or non-linear data structures?

It depends on where you intend to apply linked lists. If you based it on storage, a linked list is considered non-linear. On the other hand, if you based it on access strategies, then a linked list is considered linear.

72) How does dynamic memory allocation help in managing data?

Apart from being able to store simple structured data types, dynamic memory allocation can combine separately allocated structured blocks to form composite structures that expand and contract as needed.

73) What is FIFO?

FIFO stands for First-in, First-out, and is used to represent how data is accessed in a queue. Data has been inserted into the queue list the longest is the one that is removed first.

74) What is an ordered list?

An ordered list is a list in which each node's position in the list is determined by the value of its key component, so that the key values form an increasing sequence, as the list is traversed.

75) What is merge sort?

Merge sort, is a divide-and-conquer approach for sorting the data. In a sequence of data, adjacent ones are merged and sorted to create bigger sorted lists. These sorted lists are then merged again to form an even bigger sorted list, which continues until you have one single sorted list.

76) Differentiate NULL and VOID

Null is a value, whereas Void is a data type identifier. A variable that is given a Null value indicates an empty value. The void is used to identify pointers as having no initial size.

77) What is the primary advantage of a linked list?

A linked list is an ideal data structure because it can be modified easily. This means that editing a linked list works regardless of how many elements are in the list.

78) What is the difference between a PUSH and a POP?

Pushing and popping applies to the way data is stored and retrieved in a stack. A push denotes data being added to it, meaning data is being "pushed" into the stack. On the

other hand, a pop denotes data retrieval, and in particular, refers to the topmost data being accessed.

79) What is a linear search?

A linear search refers to the way a target key is being searched in a sequential data structure. In this method, each element in the list is checked and compared against the target key. The process is repeated until found or if the end of the file has been reached.

80) How does variable declaration affect memory allocation?

The amount of memory to be allocated or reserved would depend on the data type of the variable being declared. For example, if a variable is declared to be of integer type, then 32 bits of memory storage will be reserved for that variable.

81) What is the advantage of the heap over a stack?

The heap is more flexible than the stack. That's because memory space for the heap can be dynamically allocated and de-allocated as needed. However, the memory of the heap can at times be slower when compared to that stack.

82) What is a postfix expression?

A postfix expression is an expression in which each operator follows its operands. The advantage of this form is that there is no need to group sub-expressions in parentheses or to consider operator precedence.

83) What is Data abstraction?

Data abstraction is a powerful tool for breaking down complex data problems into manageable chunks. This is applied by initially specifying the data objects involved and

the operations to be performed on these data objects without being overly concerned with how the data objects will be represented and stored in memory.

84) How do you insert a new item in a binary search tree?

Assuming that the data to be inserted is a unique value (that is, not an existing entry in the tree), check first if the tree is empty. If it's empty, just insert the new item in the root node. If it's not empty, refer to the new item's key. If it's smaller than the root's key, insert it into the root's left subtree, otherwise, insert it into the root's right subtree.

85) How does a selection sort work for an array?

The selection sort is a fairly intuitive sorting algorithm, though not necessarily efficient. In this process, the smallest element is first located and switched with the element at subscript zero, thereby placing the smallest element in the first position.

The smallest element remaining in the subarray is then located next to subscripts 1 through n-1 and switched with the element at subscript 1, thereby placing the second smallest element in the second position. The steps are repeated in the same manner till the last element.

86) How do signed and unsigned numbers affect memory?

In the case of signed numbers, the first bit is used to indicate whether positive or negative, which leaves you with one bit short. With unsigned numbers, you have all bits available for that number. The effect is best seen in the number range (an unsigned 8-bit number has a range 0-255, while the 8-bit signed number has a range -128 to +127).

87) What is the minimum number of nodes that a binary tree can have?

A binary tree can have a minimum of zero nodes, which occurs when the nodes have NULL values. Furthermore, a binary tree can also have 1 or 2 nodes.

88) What are dynamic data structures?

Dynamic data structures are structures that expand and contract as a program runs. It provides a flexible means of manipulating data because it can adjust according to the size of the data.

89) In what data structures are pointers applied?

Pointers that are used in linked list have various applications in the data structure. Data structures that make use of this concept include the Stack, Queue, Linked List and Binary Tree.

90) Do all declaration statements result in a fixed reservation in memory?

Most declarations do, with the exemption of pointers. Pointer declaration does not allocate memory for data, but for the address of the pointer variable. Actual memory allocation for the data comes during run-time.

91) What are ARRAYS?

When dealing with arrays, data is stored and retrieved using an index that refers to the element number in the data sequence. This means that data can be accessed in any order. In programming, an array is declared as a variable having a number of indexed elements.

92) What is the minimum number of queues needed when implementing a priority queue?

The minimum number of queues needed in this case is two. One queue is intended for sorting priorities while the other queue is used for actual storage of data.

93) Which sorting algorithm is considered the fastest?

There are many types of sorting algorithms: quick sort, bubble sort, balloon sort, radix sort, merge sort, etc. Not one can be considered the fastest because each algorithm is designed for a particular data structure and data set. It would depend on the data set that you would want to sort.

94) Differentiate STACK from ARRAY.

Stack follows a LIFO pattern. It means that data access follows a sequence wherein the last data to be stored when the first one to be extracted. Arrays, on the other hand, does not follow a particular order and instead can be accessed by referring to the indexed element within the array.

95) Give a basic algorithm for searching a binary search tree.

if the tree is empty, then the target is not in the tree, end search

2. if the tree is not empty, the target is in the tree

3. check if the target is in the root item

4. if a target is not in the root item, check if a target is smaller than the root's value

5. if a target is smaller than the root's value, search the left subtree

6. else, search the right subtree

96) What is a dequeue?

A dequeue is a double-ended queue. This is a structure wherein elements can be inserted or removed from either end.

97) What is a bubble sort and how do you perform it?

A bubble sort is one sorting technique that can be applied to data structures such as an array. It works by comparing adjacent elements and exchanges their values if they are out of order. This method lets the smaller values “bubble” to the top of the list, while the larger value sinks to the bottom.

98) What is Cloud Computing ?

Cloud computing is a type of computing that relies on shared computing resources rather than having local servers or personal devices to handle applications.

In its most simple description, cloud computing is taking services ("cloud services") and moving them outside an organization's firewall. Applications, storage and other services are accessed via the Web. The services are delivered and used over the Internet and are paid for by the cloud customer on an as-needed or pay-per-use business model.

99) Explain the concept of IOT ?

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

100) What is Machine Learning ?

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide. The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

Interview Experiences:

Interview Experiences of Our Students Nikhil t:

HR TEAM came to my college RVR JC
i went to 8 am in my bus
and interviews started from 9 am
upto 1:30 pm all the girls were interviewed
as all know there will be tr , mr (skype) and hr(direct face 2 face)
my friends asked few girls about the interview procedure and questions
i didnt ask becoz i am full shy to ask , anyway thats different from current topic
they told few questions

Q1. what are diff between c c++ java and java python ?
Q2. what is abstraction polymorphism etc on oops concepts
Q3. basic questions blah blah blah

now our boys turn had started

there are 5 panels btw
they sorted according to our name given at time registration
so I am almost last
my friends whose names starts with A had went first
and they came after 15-20 min
i am very curious to know what happened?
some told that medium questions
like asking a program to write (matrix addition ,multiplication)
how many sorting techniques you know?
and which is the best in time complexity?
then some other questions related to LATEST TRENDS
like machine learning , big data ,blah blah blah
you no need to know in depth just you need to know
some of other department students like ece , eee ,mech were interviewed in their core
subjects
I did not even understood what are those becoz i am cse student
i fell udner panel 3
my friend was also under same panel before me
he went first
and returned
i asked him

he told that some advanced dbms(database) concepts
and he told about his project

now its my turn
its about 5:15 pm in the evening
tr's went to tea break and came
they told to come in
now there is laptop in front of me with a headset with mic
i sat down and feeling super nervous becoz its my first skype interview

there are two TR members in skype and one HR in face2face
interview had went like this

TR : tell me about yourself
me : i had introduced my self and my hands started shivering

TR : what languages do you know?
me : basics in C , JAVA and intermediate in python

TR : why like that?
me : i had learnt c java in my clg i had done some intermediate programs but now i cant
remember as that of python

TR : okok , write a string palindrome program in c and python
me : i had written in python which took 3 lines and in c i took 5 -10 min and showed
them

TR : okok , how do you use pyhton in machine learning ?
me : I DONT KNOW THAT MUCH ABOUT MACHINE LEARNING

TR : (secondmember) : which other language you use in ml other than python?
me : i have no idea sir

TR : ok ok , what databases you know ?
me : sql , mongo db (here's my intention is to divert them to the mongo db as i forgot
sql basics also ,eventually persons will actually grasp the second word than first word)

TR : is mongo db rdbms or non rdbms ?
me : non rdbms its nosql and document based database

TR : how data is stored in mongodb?
me : in json format

TR : okok, what is client server architecture ?

me : i answered

TR : what is three tier architecture ?

me : i answered

TR : in IOT

my mind started shivering becoz i am not an ece guy and i dont know about IOT
i waited for him to complete the question

TR : in IOT , we are about to use IPv6 addresses , what do you know about them ?

now my mind was so happy as i know networking

i answered in depth somewhat

TR : what is webservices?

me : i answered

TR : ok naga sai nikhil thank you

i was shocked and feared if they mean "YOU CAN LEAVE FOR TODAY "

Then HR asked TR 's

TR told that i am good to go to HR

THIS DOES PUT A SMIILE ON MY FACE

Ccoming to HR

he took my resume when i entered the room

upto then he read it

one thing i tell you friends is to put your projects remember this line

HR : what is flipkart scraper?

as i have done project on webscraping

me : its a scraper which gets value of redmi note 5 and emails me when the price
changed

HR : will that require permission from flipkart ?

me : no ,becoz you can view the products and their prices without logging into flipkart

HR : you have youtube channel ?

(i have put it in my resume)

me : yes sir

HR : how many subscribers?

me : 200-300

HR : will you do weekly a video?

me : no sir i will do if i get continuous holidays and not in exams time

HR : how much money you earn?

me : i did not apply for adsense sir and also revenue will be low

HR : ok ok you are fine and you can go

and he also asked about my CTF's and some token of appreciation
as you can see clearly there are no questions like

"why TCS ? "

"tell me about tcs?"

"why should we hire you?"

"will you leave tcs if you got some better company?"

i promise and telling you there are no shit questions like this in any of the rounds

THE REASON IS

my projects :)

put on your projects in your resume even you did not complete that project

i do not have latest trend like machine learning, big data and others

i am only good at basics and cyber security(i did not tell it to TR because i lost my
codevita interview because of this)

and i do not know about results

i just had my interview ,came home, commenting here about my interview

THIS IS MY EXPERIENCE

Interview Experience of a TCS candidate (SRM chennai university !)

1.Tell me about yourself?

2.Why did you choose engineering?

3.why did you choose it company when you're from EcE?

4.Why should we hire you?

5. If any other It company offers more package like Google will you stick with Tcs or else
will you move to that company?

6.Do you prefer further studies?

7. Difference between python and C?

8.Will you be able to all weekends under pressure for 12 hours?

9. Do you have any questions?

#TCS NQT interview Experience 1

tcs-nqt-interview-questions-and-experiences

Attended TCS NQT interview in the month of June 2019 & got selected.

Two rounds – TR and HR. First was TR.

Questions were:

- Q1. What is cloud computing, application of cloud computing, SAAS?
Q2. Do you know any real-time applications of cloud computing?
Q3. What is a linear data structure?
Q4. Explain quick sort with algorithm and example?
Q5. Given an array, how will you search an element in the most efficient manner?
Q6. Difference between execution and error?

Round 2: HR

- 1) Tell me something which is not a part of your resume?
- 2) What are u doing to increase your communication skills?
- 3) Are you willing to relocate?
- 4) Why TCS?

#TCS NQT interview Experience 2

tcs nqt interview questions & experiences

Attended TCS NQT off-campus for 2018 batch & got selected.

There was one round of interview only which combined Technical, HR, MR rounds.

Questions were based on my core branch which is Electrical. All of them were basic questions like what is your fav subject, what is an induction motor, its applications, etc.

Some questions were from programming like write a program to print Fibonacci series.

Some HR questions were like – Are you willing to relocate, Are you okay with night shifts etc.

Imp points to note down:

Never lie anything in your application form or resume.

Whether you know anything or not, don't stay calm in the interview.

Smile more, be bold, be positive. They never hire candidates who are always serious and worried about little things.

Sleep well before the interview and wear neat and clean and proper formal dress. (from hair band to shoes). –

If you are cross-questioned at one of your lies, its better to tell the truth.

Do full research about the company before the interview.

Keep your voice loud and clear.

These are all the important traits which the company is looking for. So try to match these points. All the best !!

PS: If it's your day, then nothing is gonna stop you. And if it's not then no matter how hard you try, nothing gonna happen. So, the bottom line is that do your best, don't worry about the result.

Also, in the online test, I was asked this coding question – Write a Program to count the number of vowels and consonants in the word taken as an input by the user.

#TCS NQT interview Experience 3

tcs nqt interview questions

Attended TCS NQT for 2018 batch & got selected.

Overall Interview was good. You need to be confident. Prepare about projects well and basics of HTML, C. Prepare the topics which are mentioned in your resume. Some of the questions that were asked are:

- 1) Tell me about yourself?
- 2) Tell me about TCS?

- 3) Why do you want to join TCS?
- 4) Why you are applying for IT industry and why not jobs in your Core domain?
- 5) Explain your project & your role in the project?
- 6) Some HTML basics & about Embedded systems

#TCS NQT interview Experience 4

The overall interview experience was great. I am from Civil background and I was interviewed for over 40 mins. There were 2 rounds, Technical & HR interview.

Who built C?

Difference between Call by Value and Call by Address?

Difference between merge sort and insertion sort?

Example of merge sort.

How to count the elements of a String?

Basics about structure, linked list, queue.

The HR interview went for only 5 mins and they asked me only 3 questions: 1) relocation 2) background check and 3) serviceability bond.

#TCS NQT interview Experience 5

Attended TCS NQT in 2018

First of all, they asked me to introduce about myself. I said I'm confident in C, C++, JAVA, DBMS. After that a few technical questions were asked.

What is Dangling Pointer?

Basic SQL queries?

C program to check whether a number is prime?

What is a double pointer?

Briefly asked about your project.

Difference between C and C++.

Overall it was a good interview. Finally, I asked the interviewer to rate my interview. I think I shouldn't have asked that question!! The interviewer told me he can't tell that now and asked me to wait for the email.

#TCS NQT interview Experience 6

I am from Mechanical branch. My interview was on 9th Feb 2018 in MGIT college, Hyderabad. For me all the three round (TR, MR, HR) were held in one round with 3 interviewers. They asked me questions on C and JAVA as I said I am trained on those languages. Prepare all the basics of languages mentioned in your resume and be prepared on each and every line of your resume. If u think u can't answer for a question on your resume then please remove that line from your resume.

You will be asked this question "Being a non-IT student, why are u coming into this field"?.

When asked, answer carefully else they will definitely drag on this topic based on ur answer. However maybe the interviewer's face (serious or smiling), you should be confident with a smile on our face. Some topics & questions asked were:

OOPs concepts – All the definitions of OOPs concepts

- between while and do while.
- Interface definition,
- Platform dependency

- JVM
- Prime number program
- Many questions on java (I don't remember some of them)
- If you are okay with relocation, then why didn't u choose to do engineering in some other state?
- Difference between 2 stroke and 4 stroke Difference

TCS NQT Programming Questions

1. What is data abstraction? what are the three levels of data abstraction with Example?
2. What is command line argument?
3. Advantages of a macro over a function?
4. What are the different storage classes in C?
5. Which header file should you include if you are to develop a function which can accept a variable number of arguments?
6. What is cache memory?
7. What is debugger?
8. Const char *p , char const *p What is the difference between the above two?
9. What is Memory Alignment?
10. Explain the difference between 'operator new' and the 'new' operator?
11. Difference between delete and delete[]?
12. What is conversion constructor?
13. What is a spanning Tree?
14. Why should we use data warehousing and how can you extract data for analysis with an example?
15. Explain recursive function & what is the data structures used to perform recursion?
16. Differentiate between Compiler and Interpreter?
17. What is the scope of a variable?
18. What is a user-defined exception in Java?
19. What is Java Applet?
20. What do you know about the garbage collector?
21. Write a Binary Search program
22. What are enumerations?
23. What is a static identifier?
24. What is Cryptography?
25. What is encryption?
26. What is decryption?
27. What exactly is a digital signature?
28. What is an Interrupt?
29. What is trigger?
30. What do you mean by joins in SQL? Explain its type.
31. How you handle the pressure? (Following questions were asked by the Managerial guy)

32. If you are a Team Leader and one of your assistant is not working up to the mark and due to him/her, the project is being delayed. How will you handle this situation?
33. Are you comfortable working in night shift? (Following questions were asked by HR guy).
34. Are you ok with the 2-year bond?
35. Why do you want to join TCS?
36. How can VoLTE work in a 4G mobile?
37. What is an IP address?
38. What is Cloud Computing?
39. Explain types of protocols.
40. What are your strengths and weaknesses?
41. How to connect nine dots using three straight lines?

Sample Interview Experience by Student for TCS

Type of Interview: On-Campus Interview

Student Interview

Round 2: Interview Round

Technical Questions

Some of the questions asked in this section were:

- What are the properties of intrinsic semiconductor?
- What is modulation and its types?
- What is the difference between electronics and electricals?
- What is the difference between C and C++?
- What is OOPS?
- What is a Linked List?

HR Questions

- Tell me about yourself.
- Why do you want to shift your domain from ECE to IT?
- How many offers do you have?
- Why don't you join your father's business?

1. Tell which subject you read recently for interview – DBMS.
2. What is DBMS.?
3. What is advantage of DBMS?
4. What is redundancy?
5. How to remove redundancy?
6. What is Normalization?
7. Tell about normal forms?
8. What is DDL, DML, DCL?
9. Write Query to create a table?
10. Copy data from one table to another table?
11. Second max salary of an employee
12. Right outer join query and tabulated output
13. Normalization definition and anomalies
14. Give employee table asked some simple SQL query
15. What is Indexing and Clustering in RDBMS? Why we used?
16. Types of Joins in RDBMS

HR INTERVIEW QUESTIONS AND ANSWERS:

Q1. Tell me about yourself.

Hello sir, madam good morning /afternoon/evening.

I am Shilpa from Shimla.

Recently, I have completed my graduation (BTech) in electronics and communication engineering from RGIT.

I have done my schooling from girls high school with 9.7 cgpa.

I have done my intermediate from Nalanda I have secured 94%.

My father is an electrician, my mother is a teacher, I have one brother.

My strength is I am highly determined to fulfil my goals.

My role model is my parents.

My hobbies are reading books, playing indoor games.

My short-term goal is to get a job in a reputed company and my long term goal is to get a respected position in that organization.

As a fresher, I have no experience but I will try to prove myself when the opportunity comes to me. I am looking to join your company to explore my skills.

That's all about myself.

Don't make the mistake of sharing too much personal information in any of your HR interview questions and answers round. You will not be left with enough time to sell your experience and relevant technical skills

Q2. Why Should i hire you ?

As a fresher, I am having less practical knowledge but have the ability to grab things quickly and I believe in improving myself day to day is key of my success and growth of the company. I will be working with full efficiency and getting work done at the assigned time.

Q3. What are your strengths and weaknesses?

My strength is I am a very bold, self-motivated person, quick learner, honest towards my job with a positive attitude.

My weakness is I can't say no when people ask me for help, believing everyone.

Q4. Can you perform under pressure?

Most of the times, the job of software development is that of working under pressure. Sometimes, it will be the pressure of delivering on time while it can be that of a bug that has sprung all of a sudden in your code. So, expect pressure in everything you do. It is important

to maintain your performance and develop strategies to deliver under pressure. You can then go ahead and talk about your way of dealing with pressure and performing under it.

Relate with a problem which looks real: My mother was not well and my father was out of station during my exam. I had the pressure of Exam and I had to take care of my mother also, but still I performed well and I managed to get x% in 10th/12th/Graduation.

Q5. Why do you want to work at our company?

It would be a great honor to work with one of the most reputed organization. I'm sure that I'll learn many more things and will surely work with the team members and do my best.

Q6. Are you willing to relocate or travel?

Yeah, it will be cherry on cake because travelling is my hobby. So a new place new friend a new environment and new working location. It's amazing because change is necessary, and I believe in change.

Note: Never Ever say no for any questions, they are not going to send you immediately. They are checking your patience level.

Q7. Where do you see yourself five years from now?

After 5 years, I would be in more professional and better than what I am now.

I also would like to lead the team and make an ideal for my team members.

And also be make myself confidence and trustable employee as a company expect from me.

Note : don't say that I will become MD and CEO of the company and will replace you.

Q8. Give me an example of your creativity.

According to me, the creativity is not only making new things but also in the improvement of existing things. Some people think that doing different things is creativity, But I don't think so. Creativity is not only making different things just do things differently.

Relate with a real Example:

Q9. How long would you expect to work for us if hired?

I will work with your company till the day, I feel that I am not giving the best result which is required by your company, after trying my level best.

Q10. How do you feel about working nights and weekends?

Company growth is obviously employees growth, Whenever a company needs me, I will be there either in nights or weekends.

Note : Don't say no , they just wanted to check your patience level.

Q11. What are your salary expectations?

As of now, I haven't thought much about it. I'm more focused on learning the requirements for this position that I am applying for.

Q12. What motivates you to do good job?

Responsibility towards work motivates me the most, and my aim within any company is to move up to greater levels of responsibility to achieve each goal with better responsibilities.

Q13. Would you lie for the company?

It totally depends upon the situation. If lying is the last option to tackle the situation for my company I have to do it but only if it is the last, otherwise I will use my creativity to deal with the situation because in life we always have the second option. We just need to find it and make it count.

Q14. On a scale of one to ten, rate me as an interviewer.

Sir/Mam, I do not have the audacity to rate a highly qualified person like you. However, if you must insist, I would give you a 10 because I am really grateful that you gave me the opportunity to sit for this interview. This has been a really pleasant experience for me because you listened to whatever I said with patience and it is a huge thing for me. Thank you so much.

Q15. Do you have any questions for me?

Thanks sir for giving me this opportunity to ask you a question.

I want to know more about this job profile, and if anything I can learn/improve which can benefit the company.

Q16. Are not you overqualified for this position?

No sir/madam, I don't think I am overqualified for this job, in my opinion, qualification does not come with theoretical knowledge and experience makes you more qualified because analyzing the situation in real time makes us more prominent. And when it comes to knowledge learning never ends.

17. What is the difference between hard work and smart work?

HARD WORK : GIVES EXPERIENCE.

SMART WORK : COMES FROM EXPERIENCE.

What is the difference between confidence and over confidence?

" I can do it "- confidence, " Only I can do it "- overconfidence.

" I am suitable for this job "- confidence, " I am the only one suitable for this job "- overconfidence.

" Trusting yourself "- confidence, " Underestimating others "- overconfidence.

A person is confident when he knows the facts better, A person is overconfident when he knows the facts better than others.

Q18.If you won \$20 million lottery, would you still work?

Yes! Money does not give us experience but work does. And this money will be over one day but our experience of doing work is not.

If I got \$10 million lottery then I'll save it for business in future. Firstly, I'll get all the skills, knowledge, business strategies and marketing from doing a job in reputed company like yours. After getting all skills then I'll be thinking about business.

Q19. What are your career options right now?

As a fresh candidate my career option right now is to gain knowledge and earn experience from new new challenges and to upgrade myself according.

Q20 .What are your outside interests?

I love travelling because it creates an opportunity to meet new people. So, I wish to travel.

Q21. Being an ECE/Mechanical/Electrical/Civil students why do u want to Join Software Industry?

Although I belong to an Electrical/Mechanical/Electronics background over the course of four years I have discovered a strong passion for coding and would like to work in the same field since one should do the work they enjoy. Moreover here, us saying we have passion is not enough we must justify the answer by letting them know about the particular fields/languages we have developed our passion in and do not be scared if they ask you a few questions about it just to confirm what you are saying is accurate . So don't even try to bluff with the word "passion for coding"

About TCS:

Founded : 1968, 51 years ago

Headquarters: Mumbai, Maharashtra, India

Founder: Tata Sons, FC Kohli

Number of Employees: 424,285

Revenue : US\$20.9 billion

Services : Outsourcing ,Consulting ,Managed Services.

ELECTRONICS ENGINEERING QUESTIONS for SOFTWARE COMPANIES:

Questions: What is Microcontroller and Microprocessor? Name a microcontroller and a microprocessor?

Microcontroller

They are a whole complete system in themselves (maybe sometimes specific Operating System too). They consist of Processing Unit, RAM, ROM, other external peripherals.

They generally have Harvard Architecture.

The processing speed is comparatively slow.

The addresses in programming are placed outside the IC.

Examples: Arduino, 8051.

Microprocessor:

They only consist of the Processing Unit. They don't have peripherals included in them.

They generally have Von Neumann Architecture.

The processing speed is comparatively faster.

The addresses in programming have their own space.

Example: Raspberry Pi.

Q1. Explain Am And Fm.

AM-Amplitude modulation is a type of modulation where the amplitude of the carrier signal is varied in accordance with the information bearing signal. FM-Frequency modulation is a type of modulation where the frequency of the carrier signal is varied in accordance with the information bearing signal.

Q2. Name The Modulation Techniques.

For **Analog modulation**—AM, SSB, FM, PM and SM .

Digital modulation—OOK, FSK, ASK, PSK, QAM, MSK, CPM, PPM, TCM, OFDM.

Q3. What Is Demodulation?

Demodulation is the act of removing the modulation from an analog signal to get the original baseband signal back. Demodulating is necessary because the receiver system receives a modulated signal with specific characteristics and it needs to turn it to base-band.

Q4. What Is Cut-off Frequency?

The frequency at which the response is -3dB with respect to the maximum response.

Q5. What Is Op-amp?

An operational amplifier, often called an op-amp, is a DC-coupled high-gain electronic voltage amplifier with differential inputs and, usually, a single output. Typically the output of the op-amp is controlled either by negative feedback, which largely determines the magnitude of its output voltage gain, or by positive feedback, which facilitates regenerative gain and oscillation.

Q6. What Is Transistor?

In electronics, a transistor is a semiconductor device commonly used to amplify or switch electronic signals. The transistor is the fundamental building block of computers, and all other modern electronic devices. Some transistors are packaged individually but most are found in integrated circuits.

Q7. What Is Diode?

In electronics, a diode is a two-terminal device. Diodes have two active electrodes between which the signal of interest may flow, and most are used for their unidirectional current property.

Q8. What Is A Semi Conductor?

A semiconductor is a solid material that has electrical conductivity in between that of a conductor and that of an insulator (An insulator is a material that resists the flow of electric current. It is an object intended to support or separate electrical conductors without passing current through itself); it can vary over that wide range either permanently or dynamically.

Q9. What Is Conductor?

A substance, body, or device that readily conducts heat, electricity, sound, etc. Copper is a good conductor of electricity.

Q10. What Is Inductor?

An inductor is a passive electrical device employed in electrical circuits for its property of inductance. An inductor can take many forms.

Q11. What Is Capacitor?

A capacitor is an electrical/electronic device that can store energy in the electric field between a pair of conductors (called "plates"). The process of storing energy in the capacitor is known as

“charging”, and involves electric charges of equal magnitude, but opposite polarity, building up on each plate.

Capacitors are often used in electric and electronic circuits as energy-storage devices. They can also be used to differentiate between high-frequency and low-frequency signals. This property makes them useful in electronic filters.

Q12. What Is A Rectifier?

A rectifier changes alternating current into direct current. This process is called rectification. The three main types of rectifier are the half-wave, full-wave, and bridge. A rectifier is the opposite of an inverter, which changes direct current into alternating current. HWR- The simplest type is the half-wave rectifier, which can be made with just one diode. When the voltage of the alternating current is positive, the diode becomes forward biased and current flows through it. When the voltage is negative, the diode is reverse-biased and the current stops.

Q13. What Is An Integrated Circuit?

An integrated circuit (IC), also called a microchip, is an electronic circuit etched onto a silicon chip. Their main advantages are low cost, low power, high performance, and very small size.

Q14. What Is Oscillator?

An oscillator is a circuit that creates a waveform output from a direct current input. The two main types of oscillator are harmonic and relaxation. The harmonic oscillators have smooth curved waveforms, while relaxation oscillators have waveforms with sharp changes.

Q15. What Is A Feedback? And Explain Different Types Of Feedback.

Feedback is a process whereby some proportion of the output signal of a system is passed (fed back) to the input. This is often used to control the dynamic behaviour of the system.

Types of feedback:

Negative feedback: This tends to reduce output (but in amplifiers, stabilizes and linearizes operation). Negative feedback feeds part of a system's output, inverted, into the system's input; generally with the result that fluctuations are attenuated.

Positive feedback: This tends to increase output. Positive feedback, sometimes referred to as “cumulative causation”, is a feedback loop system in which the system responds to perturbation (A perturbation means a system, is an alteration of function, induced by external or internal mechanisms) in the same direction as the perturbation. In contrast, a system that responds to the perturbation in the opposite direction is called a negative feedback system.

Bipolar feedback: which can either increase or decrease output.

Q16. Explain Full Duplex And Half Duplex.

Full duplex refers to the transmission of data in two directions simultaneously. For example, a telephone is a full-duplex device because both parties can talk at once. In contrast, a walkie-talkie is a half-duplex device because only one party can transmit at a time. Most

modems have a switch that lets you choose between full-duplex and half-duplex modes. The choice depends on which communications program you are running.

In full-duplex mode, data you transmit does not appear on your screen until it has been received and sent back by the other party. This enables you to validate that the data has been accurately transmitted. If your display screen shows two of each character, it probably means that your modem is set to half-duplex mode when it should be in full-duplex mode.

Q17. What Is Barkhausen Criteria?

Barkhausen criteria, without which you will not know which conditions are to be satisfied for oscillations.

“Oscillations will not be sustained if, at the oscillator frequency, the magnitude of the product of the transfer gain of the amplifier and the magnitude of the feedback factor of the feedback network (the magnitude of the loop gain) are less than unity”.

The condition of unity loop gain $-A\beta = 1$ is called the Barkhausen criterion. This condition implies that $|A\beta| = 1$ and that the phase of $-A\beta$ is zero.

Q18. What Is An Amplifier?

An electronic device or electrical circuit that is used to boost (amplify) the power, voltage or current of an applied signal.

Q19. What Is Cdma, Tdma, Fdma?

Code division multiple access (CDMA) is a channel access method utilized by various radio communication technologies. CDMA employs spread-spectrum technology and a special coding scheme (where each transmitter is assigned a code) to allow multiple users to be multiplexed over the same physical channel. By contrast, time division multiple access (TDMA) divides access by time, while frequency-division multiple access (FDMA) divides it by frequency.

An analogy to the problem of multiple access is a room (channel) in which people wish to communicate with each other. To avoid confusion, people could take turns speaking (time division), speak at different pitches (frequency division), or speak in different directions (spatial division).

In CDMA, they would speak different languages. People speaking the same language can understand each other, but not other people. Similarly, in radio CDMA, each group of users is given a shared code. Many codes occupy the same channel, but only users associated with a particular code can understand each other.

Q20. What Is Multiplexing?

Multiplexing (known as muxing) is a term used to refer to a process where multiple analog message signals or digital data streams are combined into one signal over a shared medium. The aim is to share an expensive resource. For example, in telecommunications, several phone calls may be transferred using one wire.

Q21. What Is A Repeater?

A repeater is an electronic device that receives a signal and retransmits it at a higher level and/or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances without degradation.

Q22. Difference Between Electronic And Electrical.

Electronics work on DC and with a voltage range of -48vDC to +48vDC. If the electronic device is plugged into a standard wall outlet, there will be a transformer inside which will convert the AC voltage you are supplying to the required DC voltage needed by the device.

Examples: Computer, radio, T.V, etc...

Electric devices use line voltage (120vAC, 240vAC, etc...). Electric devices can also be designed to operate on DC sources, but will be at DC voltages above 48v.

Examples: incandescent lights, heaters, fridge, stove, etc...

Read About Sampling theorem, Base station, Antenna, 3G/4G/5G.

MECHNAICAL BRANCH INTERVIEW QUESTIONS:**Q1. What Is Extruded Aluminum?**

Extrusion is the process where a metal or a metal bar is pulled through a mandrel to elongate it and/or give it a final shape.

Extruded Aluminum is a common form of making small aluminum wire, bars or beams and many varieties of small non-structural, decorative pieces.

Q2. What Is The Mechanical Advantage Of A Double Pulley?

It only takes half the effort to move an object but twice the distance.

Q3. What Is Knurling?

Knurling is a machining process normally carried out on a centre lathe. The act of Knurling creates a raised criss-cross pattern on a smooth round bar that could be used as a handle or something that requires extra grip.

Q4. How Does Hydraulic Clutches Work?

By using a non-compressible fluid, it acts like a solid push rod.

Q5. Why Is Over-pressurizing An Air Conditioning System Bad?

Overcharging a refrigeration or air conditioning system can result in an explosion. To avoid serious injury or death, never overcharge the system. Always use proper charging techniques. Limit charge amounts to those specified on the system equipment serial label or in the original equipment manufacturer's service information.

Overcharging the system immerses the compressor motor, piston, connecting rods, and cylinders in liquid refrigerant. This creates a hydraulic block preventing the compressor from starting. The hydraulic block is also known as locked rotor.

Continued supply of electricity to the system causes heat to build in the compressor. This heat will eventually vaporize the refrigerant and rapidly increase system pressure. If, for any reason, the thermal protector fails to open **the** electrical circuit, system pressure can raise to high enough levels to cause a compressor-housing explosion.

Q6. Will A Steel Cable Become Longer If It Is Heated While Under Load?

Even the heaviest steel cables stretch under load, whether they heat or not. Heating the cable will certainly elongate it. Friction caused by guides or pulleys can greatly increase the temperature of a cable under load.

You might consider the possibility of total failure if the heat is high enough and I am not sure but the cable might act in unpredictable ways when it fails. Applying heat to a steel cable under load is probably dangerous to your health and the health of anyone nearby.

When steel is heated, steel expands. It does not need to be under load. That is the reason that in the old days before advanced electronics and optics surveyors used chains rather than cables for measuring land. Had they used cable they would have gotten different measurements in summer and winter based on the difference in temperature and the coefficient of expansion of the material. The coefficient of expansion is a number that informs just how much a given material will expand or contract for a given change in temperature.

To find the coefficient of expansion and other interesting information consult a materials handbook, available in better libraries or your local college of engineering. Another example of expanding steel and the necessity for dealing with this characteristic is the overlapping slip joint found on bridges that allows horizontal structural members to expand and contract without damaging the bridge.

Q7. What Is The Congressional Space Medal Of Honor?

The medal was created in 1969, designed by Congress for "any astronaut who in the performance of his duties has distinguished himself by exceptionally meritorious efforts and contributions to the welfare of the Nation and mankind.

Q8. What Is The Law Of Thermodynamics?

There are actually 3 Laws of Thermodynamics (the actual number is debatable, but the number ranges from 3-5, depending on your adding skills).

Q9. Is It The Stress That, Produces Strain Or Strain Produces Stress?

A Force applied to an object will cause a displacement. Strain is effectively a measure of this displacement (change in length divided by original length).

Stress is the Force applied divided by the area it is applied. (E.g. pounds per square inch) Therefore, to answer the question, the applied force produces both "Stress and Strain". "Stress and Strain" are linked together by various material properties such as Poisson's ratio and Young's Modulus.

Q10.. How Does A Super Charger Work In A Car?

A supercharger is a used to increase the volume of air dragged into each cylinder per stroke. In combustion engines, there are only really two ways to increase power, firstly increase the amount of fuel in the engine (either increase the displacement, or add more cylinders) or increase the amount of air in the engine (for a more effective explosion of the fuel)

Superchargers are powered by the engine's crankshaft, which is connected usually by a belt drive. This rotational power turns a fan, which sucks air into the intake manifold similar in effect to turbochargers, with reduced lag. However, superchargers take more energy out of the engine, so they have drawbacks.

Q11. Why Do The Radiators In Your House Click When You Start The Heating System?

They are clicking because they are heating up. The heat causes expansion and that is why you hear clicking.

Q12. How Can I See Where Pipes Are Behind The Wall?

By using radio waves.

Q13. How Are The Pneumatic System And The Hydraulic System Similar?

Pneumatics use gases such as air or nitrogen, hydraulics use oil or water, both systems use pressure to act on a specific application.

Q14. What Is The Difference Between An Electric Motor And An Electric Generator?

There is no fundamental difference between an electric motor and an electric generator or dynamo. In normal use, all motors behave as generators, and all generators behave as motors. DC Motors act like generators because they use less electrical energy when allowed to spin fast. DC generators act like motors because they become easier to spin when less electrical energy is drawn from their terminals.

For example, connect two small DC magnet motors together. Then if you spin the shaft of the first motor, the second motor's shaft will start spinning too. One acts as a DC generator, and the other acts as a DC motor. Alternatively, spin the second one's shaft, and the first one will start spinning.

Another example: If you connect a small DC motor to a small battery, then an electric current will appear in the motor's coils, and the motor starts spinning. However, if you spin the motor's shaft slightly faster than the normal speed, the direction of current in the circuit will reverse, and the battery starts taking in energy from the motor. The motor has become a generator, and it is recharging the battery.

Question 15. What Are Some Examples Of A Periscope?

It is an optical instrument for viewing objects, which are above the level of direct sight; mostly used in submarines.

Maintenance, repair and operations (MRO)

Q16. What Does Green Field Project Mean?

Green field projects are those projects, which do not create any environmental nuisance (pollution), follow environmental management system and EIA (environment impact assessment). These projects are usually of big magnitude.

Q17. Is Pipe Round Because It Provides The Least Area To Volume Ratio?

More likely because it is easier to manufacture, much easier to put threads on, you do not have to worry about orientation when you put them together, and they have no weak spots created by corners.

My gutter pipes are rectangular because they do not stick out as far from the house as a circular one with the same area. However, they are low enough in the pressure they contain that they can be formed from sheet metal with a crimped seam. Making a water supply pipe, that way would be impossible.

In addition, it is easy to keep them aligned to the house. Running a rectangular water main under a street would be a major pain.

Solar Water Pumps Interview Questions

Q18.How Does Hydraulics Work?

A positive displacement pump (gear, vane, or piston pump) is driven by a prime mover (Electrical Motor or Engine) it sucks fluid from reservoir and delivers oil to system. During loading, a resistance to flow creates the pressure, which is utilized to do the work through cylinder for linear motion, or through hydraulic motor for rotary motion, Direction of flow is changed with help of direction control valve & system pressure is regulated by pressure control valve & flow is regulated by flow control valve.

Q19.What Is The Difference Between Hydraulic Oil And Engine Oil?

Both the hydraulic and engine oils are made from base oils with additives mixed in. The additives used change the characteristics of the oils so that they function differently.

Generally, hydraulic oils (final product including additives) are expected to have very low compressibility and very predictable friction and viscosity stability under pressure.

Generally engine oils (Engine Lubrication Oils anyway) are intended to have high resistance to heat (degradation including chemical and viscosity due to heat) resistance to burning and resistance to absorption of fuels and chemical compounds produced during combustion.

Both classes of oils are likely to have additives intended to provide detergency and to reduce foaming.

Base oils are most commonly petroleum oil bases due to cost, but other bases oil can be used including mineral oils (especially for hydraulic oils) and plant oils (especially for engine oils) and oils from animal sources.

Q20.What Does Angular Momentum Mean?

Angular momentum is an expression of an objects mass and rotational speed.

Momentum is the velocity of an object times it is mass, or how fast something is moving how much it weigh. Therefore, angular momentum is the objects mass times the angular velocity where angular velocity is how fast something is rotating expressed in terms like revolutions per minute or radians per second or degrees per second

Note : Read About 2stroke/4Stroke and all.

ELECTRICAL ENGINEERING QUESTIONS:

Q1.What Is The Difference Between A Verilog Task And A Verilog Function?

The following rules distinguish tasks from functions:

A function shall execute in one simulation time unit; a task can contain time-controlling statements.

A function cannot enable a task; a task can enable other tasks or functions.

A function shall have at least one input type argument and shall not have an output or inout type argument; a task can have zero or more arguments of any type.

A function shall return a single value; a task shall not return a value.

Q2. What Is Electric Traction?

Electric traction means using the electric power for traction system (i.e. for railways, trams, trolleys etc).

Electric traction means use of the electricity for railways, trams, trolleys etc. Now a days, magnetic traction is also used for bullet trains. and basically dc motors are used for electric traction systems.

Q3. What Is "pu" In Electrical Engineering?

Pu stands for per unit and this will be used in single line diagram of power distribution and it is like a huge electrical circuit with no of components (generators, transformers, loads) with different ratings (in MVA and KV). To bring all the ratings into common platform we use pu concept in which, in general largest MVA and KV ratings of the component is considered as base values, then all other component ratings will get back into this basis. Those values are called as pu values.

Q4. Why Link Is Provided In Neutral Of An Ac Circuit And Fuse In Phase Of Ac Circuit?

Link is provided at a Neutral common point in the circuit from which various connection are taken for the individual control circuit and so it is given in a link form to withstand high Amps. But in the case of Fuse in the Phase of AC circuit it is designed such that the fuse rating is calculated for the particular circuit (i.e load) only. So if any malfunction happen the fuse connected in the particular control circuit alone will blow off.

Q5. How Tube Light Circuit Is Connected And How It Works?

A choke is connected in one end of the tube light and a starter is in series with the circuit. When supply is provided, the starter will interrupt the supply cycle of AC. Due to the sudden change of supply the choke will generate around 1000volts. This volt will be capable of to break the electrons inside the tube to make electron flow. once the current passes through the tube the starter circuit will be out of part. now there is no change of supply causes choke voltage normalized and act as minimize the current.

Q6. What Is Marx Circuit?

It is used with generators for charging a number of capacitor in parallel and discharging them in series. It is used when voltage required for testing is higher than the available

Q7. What Are The Advantages Of Speed Control Using Thyristor?

Advantages :

Fast Switching Characteristics than Mosfet, BJT, IGBT.

Low cost.

Higher Accuracy.

Q8. Why Human Body Feel Electric Shock ?? N In An electric Train During Running , We Did Nt Feel Any shock ? Why?

Unfortunately our body is a pretty good conductor of electricity, The golden rule is Current takes the lowest resistant path if you have insulation to our feet as the circuit is not complete (wearing rubber footwear which doing some repairs is advisable as our footwear is a high resistance path not much current flows through our body).The electric train is well insulated from its electrical system.

Q9. What Is The Principle Of Motor?

Whenever a current carrying conductor is placed in an magnetic field it produce turning or twisting movemnt is called as torque.

Q10. Why, When Birds Sit On Transmission Lines Or Current Wires Doesn't Get Shock?

Its true that if birds touch the single one line (phase or neutral) they don't get electrical shock... if birds touch 2 lines than the circuit is closed and they get electrical shock.. so if a human touch single one line(phase) then he doesn't get shock if he is in the air (not touching – standing on the ground if he is standing on the ground then touching the line (phase) he will get a shock because the ground on what we standing is like line (ground bed – like neutral)? and in the most of electric lines the neutral is grounded..so that means that human who touch the line closes the circuit between phase and neutral.

Q11.What Happen If We Give 220 Volts Dc Supply To D Bulb R Tube Light?

Bulbs [devices] for AC are designed to operate such that it offers high impedance to AC supply. Normally they have low resistance. When DC supply is applied, due to low resistance, the current through lamp would be so high that it may damage the bulb element.

Q12. Which Motor Has High Starting Torque And Staring Current Dc Motor, Induction Motor Or Synchronous Motor?

DC Series motor has high starting torque. We can not start the Induction motor and Synchronous motors on load, but can not start the DC series motor without load.

Q13.What Is Acsr Cable And Where We Use It?

ACSR means Aluminium conductor steel reinforced, this conductor is used in transmission & distribution.

Q14. What Will Happen When Power Factor Is Leading In Distribution Of Power?

If their is high power factor, i.e if the power factor is close to one:
losses in form of heat will be reduced,
cable becomes less bulky and easy to carry, and very cheap to afford, &
it also reduces over heating of tranformers.

Q15. What Is The One Main Difference Between Ups & Inverter ? And Electrical Engineering & Electronics Engineering ?

uninterrupt power supply is mainly use for short time .means according to ups VA it gives backup.

ups is also two types :

on line.

offline.

online ups having high volt and amp for long time backup with high dc voltage. but ups start with 2v dc with 7 amp. but inverter is start with 2v, 24, dc to 36v dc and 20amp to 80amp battery with long time backup.

Q16. What Is 2 Phase Motor?

A two phase motor is a motor with the starting winding and the running winding have a phase split.

e.g; ac servo motor. where the auxiliary winding and the control winding have a phase split of 90 degree

Q17. What Is Power Factor? Whether It Should Be High Or Low? Why?

Power factor should be high in order to get smooth operation of the system. Low power factor means losses will be more. it is the ratio of true power to apparent power. it has to be ideally 1. if it is too low then cable over heating & equipment overloading will occur.

if it is greater than 1 then load will act as capacitor and starts feeding the source and will cause tripping. (if pf is poor ex: 0.17 to meet actual power load has to draw more current (V constant), result in more losses if pf is good.

ex: 0.95 to meet actual power load has to draw less current (V constant), result in less losses).

Q18. There Are A Transformer And An Induction Machine. Those Two Have The Same Supply. For Which Device The Load Current Will Be Maximum? And Why?

The motor has max load current compare to that of transformer because the motor consumes real power.. and the transformer is only producing the working flux and its not consuming.. hence the load current in the transformer is because of core loss so it is minimum.

Q19. Explain The Working Principal Of The Circuit Breaker?

Circuit Breaker is one which makes or breaks the circuit. It has two contacts namely fixed contact & moving contact. under normal condition the moving contact comes in contact with fixed contact thereby forming the closed contact for the flow of current. During abnormal & faulty conditions (when current exceeds the rated value) an arc is produced between the fixed & moving contacts & thereby it forms the open circuit. Arc is extinguished by the Arc Quenching media like air, oil, vacuum etc

Q20. How Many Types Of Colling System It Transformers?

ONAN (oil natural, air natural).

ONAF (oil natural, air forced).

OFAF (oil forced, air forced).

ODWF (oil direct, water forced).

OFAN (oil forced, air forced).

Q21. What Is Stepper Motor. what Is Its Uses?

Stepper motor is the electrical machine which act upon input pulse applied to it. it is one type of synchronous motor which runs in steps in either direction instead of running in complete cycle. so, in automation parts it is used.

Q22. Why The Capacitors Works On Ac Only?

Generally capacitor gives infinite resistance to dc components(i.e., block the dc components). it allows the ac components to pass through.

Q23. What Happens If I Connect A Capacitor To A Generator Load?

Connecting a capacitor across a generator always improves power factor, but it will help depends up on the engine capacity of the alternator, otherwise the alternator will be overloaded due to the extra watts consumed due to the improvement on pf. Secondly, don't connect a capacitor across an alternator while it is picking up or without any other load.

Q24. What Is The Difference Between Surge Arrestor And Lightning Arrestor?

LA is installed outside and the effect of lightning is grounded, where as surge arrestor installed inside panels comprising of resistors which consumes the energy and nullify the effect of surge.

Q25. Why Use The Vcb At High Transmission System ? Why Can't Use Acb?

Actually the thing is vacuum has high arc quenching property compare to air because in VCB, the dielectric strengths equal to 8 times of air. That is why always vacuum used as in HT breaker and air used as in LT.

Q26. Difference Between A Four Point Starter And Three Point Starter?

The shunt connection in four point starter is provided separately from the line where as in three point starter it is connected with line which is the drawback in three point starter.

OPERATING SYSTEM QUESTIONS:

1) Explain the main purpose of an operating system?

Operating systems exist for two main purposes. One is that it is designed to make sure a computer system performs well by managing its computational activities. Another is that it provides an environment for the development and execution of programs.

2) What is demand paging?

Demand paging is referred when not all of a process's pages are in the RAM, then the OS brings the missing (and required) pages from the disk into the RAM.

3) What are the advantages of a multiprocessor system?

With an increased number of processors, there is a considerable increase in throughput. It can also save more money because they can share resources. Finally, overall reliability is increased as well.

4) What is kernel?

A kernel is the core of every operating system. It connects applications to the actual processing of data. It also manages all communications between software and hardware components to ensure usability and reliability.

5) What are real-time systems?

Real-time systems are used when rigid time requirements have been placed on the operation of a processor. It has well defined and fixed time constraints.

6) What is a virtual memory?

Virtual memory is a memory management technique for letting processes execute outside of memory. This is very useful especially if an executing program cannot fit in the physical memory.

7) Describe the objective of multiprogramming.

The main objective of multiprogramming is to have a process running at all times. With this design, CPU utilization is said to be maximized.

8) What is time- sharing system?

In a Time-sharing system, the CPU executes multiple jobs by switching among them, also known as multitasking. This process happens so fast that users can interact with each program while it is running.

9) What is SMP?

SMP is a short form of Symmetric Multi-Processing. It is the most common type of multiple-processor systems. In this system, each processor runs an identical copy of the operating system, and these copies communicate with one another as needed.

10) How are server systems classified?

Server systems can be classified as either computer-server systems or file server systems. In the first case, an interface is made available for clients to send requests to perform an action. In the second case, provisions are available for clients to create, access and update files.

11) What is asymmetric clustering?

In asymmetric clustering, a machine is in a state known as hot standby mode where it does nothing but to monitor the active server. That machine takes the active server's role should the server fail.

12) What is a thread?

A thread is a basic unit of CPU utilization. In general, a thread is composed of a thread ID, program counter, register set, and the stack.

13) Give some benefits of multithreaded programming.

- there is increased responsiveness to the user
- resource sharing within the process
- economy
- utilization of multiprocessing architecture

14) Briefly explain FCFS.

FCFS stands for First-come, first-served. It is one type of scheduling algorithm. In this scheme, the process that requests the CPU first is allocated the CPU first. Implementation is managed by a FIFO queue.

15) What is RR scheduling algorithm?

RR (round-robin) scheduling algorithm is primarily aimed for time-sharing systems. A circular queue is a setup in such a way that the CPU scheduler goes around that queue, allocating CPU to each process for a time interval of up to around 10 to 100 milliseconds.

16) What are necessary conditions which can lead to a deadlock situation in a system?

Deadlock situations occur when four conditions occur simultaneously in a system: Mutual exclusion; Hold and Wait; No preemption; and Circular wait.

17) Enumerate the different RAID levels.

RAID 0 – Non-redundant striping

RAID 1 – Mirrored Disks

RAID 2 – Memory-style error-correcting codes

RAID 3 – Bit-interleaved Parity

RAID 4 – Block-interleaved Parity

RAID 5 – Block-interleaved distributed Parity

RAID 6 – P+Q Redundancy

18) Describe Banker's algorithm

Banker's algorithm is one form of deadlock-avoidance in a system. It gets its name from a banking system wherein the bank never allocates available cash in such a way that it can no longer satisfy the needs of all of its customers.

19) What factors determine whether a detection-algorithm must be utilized in a deadlock avoidance system?

One is that it depends on how often a deadlock is likely to occur under the implementation of this algorithm. The other has to do with how many processes will be affected by deadlock when this algorithm is applied.

20) State the main difference between logical from physical address space.

Logical address refers to the address that is generated by the CPU. On the other hand, physical address refers to the address that is seen by the memory unit.

21) How does dynamic loading aid in better memory space utilization?

With dynamic loading, a routine is not loaded until it is called. This method is especially useful when large amounts of code are needed in order to handle infrequently occurring cases such as error routines.

22) What are overlays?

Overlays are used to enable a process to be larger than the amount of memory allocated to it. The basic idea of this is that only instructions and data that are needed at any given time are kept in memory.

23) What is the basic function of paging?

Paging is a memory management scheme that permits the physical address space of a process to be noncontiguous. It avoids the considerable problem of having to fit varied sized memory chunks onto the backing store.

24) What is fragmentation?

Fragmentation is memory wasted. It can be internal if we are dealing with systems that have fixed-sized allocation units, or external if we are dealing with systems that have variable-sized allocation units.

25) How does swapping result in better memory management?

During regular intervals that are set by the operating system, processes can be copied from main memory to a backing store, and then copied back later. Swapping allows more operations to be run that can fit into memory at one time.

26) Give an example of a Process State.

- New State – means a process is being created
- Running – means instructions are being executed
- Waiting – means a process is waiting for certain conditions or events to occur
- Ready – means a process is waiting for an instruction from the main processor
- Terminate – means a process is stopped abruptly

27) What is a socket?

A socket provides a connection between two applications. Each endpoint of a communication is a socket.

28) What is Direct Access Method?

Direct Access method is based on a disk model of a file, such that it is viewed as a numbered sequence of blocks or records. It allows arbitrary blocks to be read or written. Direct access is advantageous when accessing large amounts of information.

29) When does thrashing occur?

Thrashing refers to an instance of high paging activity. This happens when it is spending more time paging instead of executing.

30) What is the best page size when designing an operating system?

The best paging size varies from system to system, so there is no single best when it comes to page size. There are different factors to consider in order to come up with a suitable page size, such as page table, paging time, and its effect on the overall efficiency of the operating system.

31) When designing the file structure for an operating system, what attributes are considered?

Typically, the different attributes for a file structure are naming, identifier, supported file types, and location for the files, size, and level of protection.

32) What is root partition?

Root partition is where the operating system kernel is located. It also contains other potentially important system files that are mounted during boot time.

33) What are device drivers?

Device drivers provide a standard means of representing I/O devices that maybe manufactured by different companies. This prevents conflicts whenever such devices are incorporated in a systems unit.

34) What are the primary functions of VFS?

VFS, or Virtual File System, separate file system generic operations from their implementation by defining a clean VFS interface. It is based on a file-representation structure known as vnode, which contains a numerical designator needed to support network file systems.

35) What are the different types of CPU registers in a typical operating system design?

- Accumulators
- Index Registers
- Stack Pointer
- General Purpose Registers

36) What is the purpose of an I/O status information?

I/O status information provides information about which I/O devices are to be allocated for a particular process. It also shows which files are opened, and other I/O device state.

37) What is multitasking?

Multitasking is the process within an operating system that allows the user to run several applications at the same time. However, only one application is active at a time for user interaction, although some applications can run “behind the scene”.

38) Explain pros and cons of a command line interface?

A command line interface allows the user to type in commands that can immediately provide results. Many seasoned computer users are well accustomed to using the command line because they find it quicker and simpler.

However, the main problem with a command line interface is that users have to be familiar with the commands, including the switches and parameters that come with it. This is a downside for people who are not fond of memorizing commands.

39) What is caching?

Caching is the processing of utilizing a region of fast memory for a limited data and process. A cache memory is usually much efficient because of its high access speed.

40) What is spooling?

Spooling is normally associated with printing. When different applications want to send an output to the printer at the same time, spooling takes all of these print jobs into a disk file and queues them accordingly to the printer.

41) What is an Assembler?

An assembler acts as a translator for low-level language. Assembly codes written using mnemonic commands are translated by the Assembler into machine language.

42) What are interrupts?

Interrupts are part of a hardware mechanism that sends a notification to the CPU when it wants to gain access to a particular resource. An interrupt handler receives this interrupt signal and “tells” the processor to take action based on the interrupt request.

43) What is GUI?

GUI is short for Graphical User Interface. It provides users with an interface wherein actions can be performed by interacting with icons and graphical symbols. People find it easier to interact with the computer when in a GUI especially when using the mouse. Instead of having to remember and type commands, users click on buttons to perform a process.

44) What is preemptive multitasking?

Preemptive multitasking allows an operating system to switch between software programs. This, in turn, allows multiple programs to run without necessarily taking complete control over the processor and resulting in system crashes.

45) Why partitioning and formatting is a prerequisite to installing an operating system?

Partitioning and formatting create a preparatory environment on the drive so that the operating system can be copied and installed properly. This includes allocating space on the drive, designating a drive name, determining and creating the appropriate file system and structure.

46) What is plumbing/piping?

It is the process of using the output of one program as an input to another. For example, instead of sending the listing of a folder or drive to the main screen, it can be piped and sent to a file, or sent to the printer to produce a hard copy.

47) What is NOS?

NOS is short for Network Operating System. It is a specialized software that will allow a computer to communicate with other devices over the network, including file/folder sharing.

48) Differentiate internal commands from external commands.

Internal commands are built-in commands that are already part of the operating system. External commands are separate file programs that are stored in a separate folder or directory.

49) Under DOS, what command will you type when you want to list down the files in a directory, and at the same time pause after every screen output?

- a) dir /w
- b) dir /p
- c) dir /s
- d) dir /w /p

Answer: d) dir /w /p

50) How would a file name EXAMPLEFILE.TXT appear when viewed under the DOS command console operating in Windows 98?

The filename would appear as EXAMPL~1.TXT . The reason behind this is that filenames under this operating system are limited to 8 characters when working under DOS environment.

51) What is a folder in Ubuntu?

There is no concept of Folder in Ubuntu. Everything included in your hardware is a FILE.

52) Explain why Ubuntu is safe and not affected by viruses?

It does not support malicious e-mails and contents, and before any e-mail is opened by users it will go through many security checks

Ubuntu uses Linux, which is a super secure O.S system

Unlike other O.S, countless Linux users can see the code at any time and can fix the problem if there is any

Malware and viruses are coded to take advantage of the weakness in Windows

53) Explain what is Unity in Ubuntu? How can you add new entries to the launcher?

In Ubuntu, Unity is the default graphical shell. On the left side of the Ubuntu, it introduces the launcher and Dash to start programs.

In order to add new entries to the launcher, you can create a file name like .desktop and then drag the file on the launcher.

54) Explain the purpose of using a libaio package in Ubuntu?

Libaio is Linux Kernel Asynchronous I/O (A/O). A/O allows even a single application thread to overlap I/O operations with other processing, by providing an interface for submitting one or more I/O requests in one system call without waiting for completion. And a separate interface to reap completed I/O operations associated with a given completion group.

55) What is the use of behavior tab in Ubuntu?

Through behaviors tab, you can make many changes on the appearance of the desktop

Auto-hide the launcher: You can use this option to reveal the launcher when moving the pointer to the defined hot spot.

Enable workspaces: By checking this option, you can enable workspace

Add show desktop icon to the launcher: This option is used to display the desktop icon on the launcher

56) What is the meaning of “export” command in Ubuntu?

Export is a command in Bash shell language. When you try to set a variable, it is visible or exported to any subprocess started from that instance of bash. The variable will not exist in the sub-process without the export command.

57) Explain how you can reset Unity Configuration?

To reset the unity configuration the simplest way to do is to hit open a Terminal or hit Atl-F2 and run the command # unity –reset

58) Explain how to access Terminal?

To access terminal, you have to go under Application Menu -> Accessories -> Terminal.

TIPS & STRATEGIES:

1. **Make Sure you have done some project and you have idea of what you done in your project and what was your role.**
2. **Don't mention in your resume: Microsoft word, Microsoft excel, windows etc.**
3. **The more Questions will be asked from your project and the language known.**
4. **If you attended some session of Machine learning/Artificial Intelligence/Data Science. Don't mention that you have a knowledge of this things.**
5. **Mechanical/Electrical/Electronics Students has to prepare basics of C programming/Data Structure and just the basics Concept of OOPS.**
6. **Mechanical/Electrical/Electronics please cover your basic subject/Core Subjects.**
7. **Whatever language you mention in Resume, you need to know About it.**
8. **Learn Basics of python Everyone.**
9. **All the Very Best for your Interview.**

Programming Questions to be Prepared for Interview:

- Reverse a String.
- Reverse a Number.
- Palindrome.
- Prime Number.
- Leap Year.
- Greatest among 10 numbers.
- Fibonacci Series.
- HCF / GCD.
- Factorial.
- Decimal to Binary & vice versa
- Armstrong Number.
- Area.
- Swap 2 numbers.

- Concatenate 2 strings.
- LCM of Two Number using CLP.
- Average of Two Numbers.
- Sum of Digits of a number.
- Binary to Decimal.
- Decimal to Binary.
- Factorial of a Number.
- Square Root of Prime Number.
- Square Root without square root.
- Armstrong Number.
- Odd-Even Number.
- Binary to Octal.
- Decimal to Octal.
- Check Leap Year.
- Area of Circle.
- Checking Palindrome (Number).
- Area of Triangle.
- Checking Palindrome (String).
- Reverse Digits of a Number.
- Checking Prime or Not.
- Bubble Sort/Insertion Sort/merge Sort.