



Many of the Multinational companies focuses on the subject knowledge also along with the programming skills and thinking capability. So in this document I am going to cover some important Subjective Knowledge related contents also along with coding problems.

CONTENT OF THIS DOCUMENT:

- 1) Frequently Asked Coding Problems **TopicWise/CategoryWise/PatternWise**.
- 2) Most important topics related to **OS/DBMS/OOPS/CN**.
- 3) **IMP MCQs** for **DS/OS/CN/DBMS/System Design**.

SECTION 1:

Frequently Asked Coding Problems TopicWise/CategoryWise/PatternWise.

Array || String || Matrix || Bit Manipulation || Link List || DP || Heap || Graph || Tree

NOTE :- Intentionally I have added less than 10 problem in each category. More will be added soon

SECTION 2:-

Most important topics related to OS/DBMS/OOPS/CN.

Important Topic for OS

- 1) Process (Attributes, state, life cycle, PCB) vs. Thread.
- 2) Scheduling Algorithms
- 3) Multiprogramming vs. Multiprocessing vs. Multitasking vs. Multithreading.
- 4) Memory Allocation
 - a) Fixed Partitioning
 - b) Dynamic Partitioning
 - c) Paging

- d) Segmentation
- 5) Internal and External Fragmentation.
- 6) Memory Allocation Technique.
- 7) Page replacement Algorithms
- 8) Deadlock
- 9) Critical section problem
- 10) Mutex vs. Semaphore

Important Topic for DBMS

- 1) Advantage of DBMS
- 2) All type of Keys
- 3) Normalization
- 4) SQL queries
- 5) Relational Algebra
- 6) Joins
- 7) Trigger, cursor, view
- 8) Dirty read problem
- 9) Conflict serializable vs. View serializable.
- 10) ACID properties.

Important Topic for COMPUTER NETWORK

- 1) Network Topology
- 2) Switch hub router bridge
- 3) Transmission modes
- 4) ipv4 vs. ipv6
- 5) Subnetting in IP
- 6) OSI layer
- 7) TCP/IP model
- 8) TCP vs. UDP
- 9) DNS DHCP FTP HTTP vs. HTTPS SMTP SNMP
- 10) Flow vs. Error control

Important Topic for OOPS

- 1) Class and Objects.
- 2) Feature/characteristics of OOPs.
- 3) Compile time and Runtime polymorphism.
- 4) Variable scopes.
- 5) static (variables, Functions, Objects).
- 6) Inheritance (Type and Mode)
- 7) Virtual (Functions and Class)
- 8) Abstract class and Interface.
- 9) Friend function and Friend class.
- 10) Call by value, reference.
- 11) This pointer
- 12) Abstraction
- 13) Exception Handling
- 14) Constructor and Destructor.
- 15) Copy constructor
- 16) copy assignment operator
- 17) References variable
- 18) Const (variable, Function, Argument)
- 19) Overloading (Function, Constructor, Operator)
- 20) Function overriding and Inline function.

SECTION 3:-

I have also created a set of 100 imp MCQS. 20 MCQS each for Computer Network/Operating System/Data Structures/System Design/DBMS with answers ending of each section.

Try to attempt them without seeing the answers after reading all the suggested topics and test your subject knowledge and let me know how much marks you got on each section by commenting down.

Because every single MCQ matters. ;)

COMPUTER NETWORKS

The computer network is

- A) Network computer with cable
- B) Network computer without cable
- C) Both of the above
- D) None of the above

FDDI used which type of physical topology?

- A) Bus
- B) Ring
- C) Star
- D) Tree

FTP stands for

- A) File transfer protocol
- B) File transmission protocol
- C) Form transfer protocol
- D) Form transmission protocol

Ethernet system uses which of the following technology.

- A) Bus
- B) Ring
- C) Star
- D) Tree

Which of the following are the network services?

- A) File service
- B) Print service
- C) Database service
- D) All of the above

If all devices are connected to a central hub, then topology is called

- A) Bus Topology
- B) Ring Topology
- C) Star Topology
- D) Tree Topology

FDDI stands for

- A) Fiber Distributed Data Interface
- B) Fiber Data Distributed Interface
- C) Fiber Dual Distributed Interface
- D) Fiber Distributed Data Interface

Which of the following is an application layer service?

- A) Network virtual terminal
- B) File transfer, access and management
- C) Mail service
- D) All of the above

Which is the main function of transport layer?

- A) Node to node delivery
- B) End to end delivery

- C) Synchronization
- d) Updating and maintaining routing tables

The layer change bits onto electromagnetic signals.

- A) Physical
- B) Transport
- C) Data Link
- D) Presentation

In mesh topology, relationship between one device and another is

- A) Primary to peer
- B) Peer to primary
- C) Primary to secondary
- D) Peer to Peer

The performance of data communications network depends on

- A) Number of users
- B) The hardware and software
- C) The transmission
- D) All of the above

Find out the OSI layer, which performs token management.

- A) Network Layer
- B) Transport Layer
- C) Session Layer
- D) Presentation Layer



The name of the protocol which provides virtual terminal in TCP/IP model is.

- A) Telnet
- B) SMTP
- C) HTTP

The layer one of the OSI model is

- A) Physical layer
- B) Link layer
- C) Router layer
- D) Broadcast layer

What is the name of the network topology in which there are bi-directional links between each possible node?

- A) Ring
- B) Star
- C) Tree
- D) Mesh

What is the commonly used unit for measuring the speed of data transmission?

- A) Bytes per second
- B) Baud
- C) Bits per second
- D) Both B and C

Which of the communication modes support two way traffic but in only once direction of a time?

- A) Simplex

- B) Half-duplex
- C) Three - quarter's duplex
- D) Full duplex

The loss in signal power as light travels down the fiber is called

- A) Attenuation
- B) Propagation
- C) Scattering
- D) Interruption

Which of the following TCP/IP protocols is used for transferring files form one machine to another.

- A) FTP
- B) SNMP
- C) SMTP
- D) RPC

Answers:

- C) Both of the above
- B) Ring
- A) File transfer protocol
- A) Bus
- D) All of the above
- C) Star Topology
- A) Fiber Distributed Data Interface
- C) Mail service

B) End to end delivery

A) Physical

D) Peer to Peer

D) All of the above

C) Session Layer

A) Telnet

A) Physical layer

D) Mesh

B) Baud

B) Half-duplex

A) Attenuation

A) FTP

DATABASE MANAGEMENT SYSTEM

DBMS is a collection of that enables user to create and maintain a database.

A) Keys

B) Translators

C) Program

D) Language Activity

In a relational schema, each tuple is divided into fields called

A) Relations

B) Domains

C) Queries

D) All of the above

In an ER model, is described in the database by storing its data.

- A) Entity
- B) Attribute
- C) Relationship
- D) Notation

DFD stands for

- A) Data Flow Document
- B) Data File Diagram
- C) Data Flow Diagram
- D) Non of the above

A top-to-bottom relationship among the items in a database is established by a

- A) Hierarchical schema
- B) Network schema
- C) Relational Schema
- D) All of the above

..... table store information about database or about the system.

- A) SQL
- B) Nested
- C) System
- D) None of these

.....defines the structure of a relation which consists of a fixed set of attribute-domain pairs.

- A) Instance
- B) Schema
- c) Program
- D) Super Key

..... clause is an additional filter that is applied to the result.

- A) Select
- B) Group-by
- C) Having
- D) Order by

A logical schema

- A) is the entire database
- B) is a standard way of organizing information into accessible parts.
- C) Describes how data is actually stored on disk.
- D) All of the above

..... is a full form of SQL.

- A) Standard query language
- B) Sequential query language
- C) Structured query language
- D) Server side query language

Processed data is called

- A) Raw data
- B) Information
- C) Useful data
- D) Source

..... is a utility to capture a continuous record of server activity and provide auditing capability.

- A) SQL server Profile
- B) SQL server service manager
- C) SQL server setup
- D) SQL server wizard.

Data items grouped together for storage purposes are called a

- A) record
- B) title
- C) list
- D) string

..... contains data assisting day to day activities of the organization.

- A) Control database
- B) Operational database
- C) Strategic database
- D) Sequential database

..... approach reduces time and effort required for design and lesser risk in database

management.

- A) Single global database
- B) Top-down approach
- C) Multiple databases
- D) None of the above

HSAM stands for

- A) Hierarchic Sequential Access Method
- B) Hierarchic Standard Access Method
- C) Hierarchic Sequential and Method
- D) Hierarchic Standard and Method

SQL server stores index information in the system table

- A) systindexes
- B) systemindexes
- C) sysind
- D) sysindexes

The one guideline to be followed while designing the database is

- A) A database design may be ambiguous.
- B) Unrelated data should be in the same table so that updating the data will be easy.
- C) It should avoid/reduce the redundancy.
- D) An entity should not have attributes.

Which of the following is not a logical database structure?

- A) Chain
- B) Network
- C) Tree
- D) Relational

..... is a preferred method for enforcing data integrity

- A) Constraints
- B) Stored procedure
- C) Triggers
- D) Cursors

Answers:

- C) Program
- B) Domains
- A) Entity
- C) Data Flow Diagram
- A) Hierarchical schema
- C) System
- B) Schema
- C) Having
- B) is a standard accessible parts.
- A) Standard query language
- B) Information
- B) SQL server service manager
- A) record
- B) Operational database

- C) Multiple databases
- A) Hierarchic Sequential Access Method
- D) sysindexes
- C) It should avoid/reduce ... redundancy.
- A) Chain
- A) Constraints

DATA STRUCTURE

Which if the following is/are the levels of implementation of data structure

- A) Abstract level
- B) Application level
- C) Implementation level
- D) All of the above

A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called

- A) AVL tree
- B) Red-black tree
- C) Lemma tree
- D) None of the above

..... level is where the model becomes compatible executable code

- A) Abstract level
- B) Application level
- C) Implementation level
- D) All of the above

Stack is also called as

- A) Last in first out
- B) First in last out
- C) Last in last out
- D) First in first out

Which of the following is true about the characteristics of abstract data types?

- i) It exports a type.
 - ii) It exports a set of operations
- A) True, False
 - B) False, True
 - C) True, True
 - D) False, False

..... is not the component of data structure.

- A) Operations
- B) Storage Structures
- C) Algorithms
- D) None of above

Which of the following is not the part of ADT description?

- A) Data
- B) Operations
- C) Both of the above
- D) None of the above



Inserting an item into the stack when stack is not full is called Operation and deletion of

item from the stack, when stack is not empty is calledoperation.

- A) push, pop
- B) pop, push
- C) insert, delete
- D) delete, insert

..... Is a pile in which items are added at one end and removed from the other.

- A) Stack
- B) Queue
- C) List
- D) None of the above

..... is very useful in situation when data have to stored and then retrieved in reverse order.

- A) Stack
- B) Queue
- C) List
- D) Link list

Which of the following is not the type of queue?

- A) Ordinary queue
- B) Single ended queue
- C) Circular queue
- D) Priority queue

The property of binary tree is

- A) The first subset is called left subtree
- B) The second subtree is called right subtree
- C) The root cannot contain NULL
- D) The right subtree can be empty

State true or false.

- i) The degree of root node is always zero.
- ii) Nodes that are not root and not leaf are called as internal nodes.

- A) True, True
- B) True, False
- C) False, True
- D) False, False

Any node is the path from the root to the node is called

- A) Successor node
- B) Ancestor node
- C) Internal node
- D) None of the above

State true or false.

- i) A node is a parent if it has successor nodes.
- ii) A node is child node if out degree is one.

- A) True, True
- B) True, False
- C) False, True
- D) False, False

..... is not an operation performed on linear list

a) Insertion b) Deletion c) Retrieval d) Traversal

A) only a,b and c

B) only a and b

C) All of the above

D) None of the above

Which is/are the application(s) of stack

A) Function calls

B) Large number Arithmetic

C) Evaluation of arithmetic expressions

D) All of the above

A is an acyclic digraph, which has only one node with indegree 0, and other nodes have indegree 1.

A) Directed tree

B) Undirected tree

C) Dis-joint tree

D) Direction oriented tree

..... Is a directed tree in which outdegree of each node is less than or equal to two.

A) Unary tree

B) Binary tree

C) Dinary tree

D) Both B and C

State true or false.

- i) An empty tree is also a binary tree.
 - ii) In strictly binary tree, the outdegree of every node is either 0 or 2.
- A) True, False
 - B) False, True
 - C) True, True
 - D) False, False

Answers:

- D) All of the above
- A) AVL tree
- C) Implementation level
- A) Last in first out
- C) True, True
- D) None of above
- D) None of the above
- A) push, pop
- B) Queue
- A) Stack
- B) Single ended queue
- D) The right subtree can be empty
- C) False, True
- B) Ancestor node
- B) True, False
- D) None of the above
- D) All of the above

- A) Directed tree
- B) Binary tree
- C) True, True

SYSTEM ANALYSIS AND DESIGN

..... is an important factor of management information system.

- A) System
- B) Data
- C) Process
- D) All

Which are the following is / are the level(s) of documentation?

- A) Documentation for management
- B) Documentation for user
- C) Documentation for data processing department
- D) All of the above

..... level supply information to strategic tier for the use of top management.

- A) Operational
- B) Environmental
- C) Competitive
- D) Tactical

In a DFD external entities are represented by a

- A) Rectangle
- B) Ellipse
- C) Diamond shaped box
- D) Circle

..... can be defined as data that has been processed into a form that is meaningful to the

recipient and is of real or perceived value in current or prospective decisions.

- A) System
- B) Information
- C) Technology
- D) Service

Use the new system at the same time as the old system to compare the results. This is known as ...

- A) Procedure Writing
- B) Simultaneous processing
- C) Parallel Operation
- D) File Conversion

Decision making model was proposed by

- A) Harry Goode
- B) Herbert A Simon
- C) Recon Michal
- D) None of this

A data flow can

- A) Only emanate from an external entity
- B) Only terminate in an external entity
- C) May emanate and terminate in an external entity
- D) May either emanate or terminate in an external entity but not both.

..... can be defined as most recent and perhaps the most comprehensive technique for

solving computer problems.

- A) System Analysis
- B) System Data
- C) System Procedure
- D) System Record

SDLC stands for

- A) System Development Life Cycle
- B) Structure Design Life Cycle
- C) System Design Life Cycle
- D) Structure development Life Cycle

..... includes review of the existing procedures and information flow.

- A) Feasibility Study
- B) Feasibility report
- C) System Design
- D) System analysis

A rectangle in a DFD represents

- A) a process
- B) a data store
- C) an external entity
- D) an input unit

..... refers to the collection of information pertinent to systems Project.

- A) Data transfer
- B) Data gathering
- C) Data Embedding
- D) Data Request

..... means coordinated effort, to communicate the information of the system written form.

- A) System documentation
- B) Resource required
- C) Development schedule
- D) User Document

MDP stands for

- A) Master Development Plan
- B) Master Design Program
- C) Mandatory Database Program
- D) Master Database Plan

External Entities may be a

- A) Source of input data only
- B) Source of input data or destination of results
- C) Destination of results only
- D) Repository of data

..... is a group of interested components working together towards a common goal by

accepting inputs and producing outputs in an organized transformation process.

- A) System
- B) Network
- C) Team
- D) System Unit

To create vehicle of information to provide evidence in the development process and to monitor

the process. This is one of the objectives of

- A) Analysis
- B) Design
- C) Development
- D) Documentation

A System is no more than idea

- A) Conceptual
- B) Logical
- C) Physical
- D) All of the above

By an external entity we mean a

- A) Unit outside the system being designed which can be controlled by an analyst.
- B) Unit outside the system whose behavior is independent of the system being designed
- C) A unit external to the system being designed
- D) A unit which is not part of a DFD

Answers:

- A) System
- D) All of the above
- D) Tactical
- A) Rectangle
- B) Information
- C) Parallel Operation
- B) Herbert A Simon
- C) May emanate andentity
- A) System Analysis
- A) System Development Life Cycle
- A) Feasibility Study
- C) an external entity
- B) Data gathering
- A) System documentation
- A) Master Development Plan
- B) Source of destination of results
- A) System

- D) Documentation
- A) Conceptual
- C) A unit external to the system being designed

OPERATING SYSTEM

Which of the following is/ are the part of operating system?

- A) Kernel services
- B) Library services
- C) Application level services
- D) All of the above

The system of generally ran one job at a time. These were called single stream batch processing.

- A) 40's
- B) 50's
- C) 60's
- D) 70's

In generation of operating system, operating system designers develop the concept of multiprogramming in which several jobs are in main memory at once.

- A) First
- B) Second
- C) Third
- D) Fourth

State True or False.

i) In spooling high speed device like a disk is interposed between running program and low-speed device

in Input/output.

ii) By using spooling for example instead of writing directly to a printer, outputs are written to the disk.

A) i-True, ii-False

B) i-True, ii-True

C) i-False, ii-True

D) i-False, ii-False

Which of the following is/are the functions of operating system?

i) Sharing hardware among users. ii) Allowing users to share data among themselves.

iii) Recovering from errors. iv) Preventing users from interfering with one another.

v) Scheduling resources among users.

A) i, ii, iii and iv only

B) ii, iii, iv and v only

C) i, iii, iv and v only

D) All i, ii, iii, iv and v

..... executes must frequently and makes the fine grained decision of which process to execute the next.

A) Long-term scheduling

B) Medium-term scheduling

C) Short-term scheduling

D) None of the above

With a page is brought into main memory only when the reference is made to a location on that page.

- A) demand paging
- B) main paging
- C) prepaging
- D) postpaging

..... provides a larger sized of virtual memory but require virtual memory which provides multidimensional memory.

- A) Paging method
- B) Segmentation method
- C) Paging and segmentation method
- D) None of these

..... is a large kernel containing virtually the complete operating system, including, scheduling, file system, device drivers and memory management.

- A) Multilithic kernel
- B) Monolithic kernel
- C) Micro kernel
- D) Macro kernel

..... is a large operating system core provides a wide range of services.

- A) Multilithic kernel
- B) Monolithic kernel
- C) Micro kernel
- D) Macro kernel

Which of the following is not the function of Microkernel?

- A) File management
- B) Low-level memory management
- C) Inter-process communication
- D) I/O interrupts management

Match the following.

- i) Mutual exclusion a) A process may hold allocated resources while waiting assignment.
- ii) Hold and wait b) No resource can be forcibly removed from a process holding it.
- iii) No preemption c) Only one process may use a resource at a time.

- A) i-a, ii-b, iii-c
- B) i-a, ii-c, iii-b
- C) i-b, ii-c, iii-a
- D) i-c, ii-a, iii-b

A direct method of deadlock prevention is to prevent the occurrences of

- A) Mutual exclusion
- B) Hold and wait
- C) Circular waits
- D) No preemption

The methods or algorithms which are used to increase the performance of disk storage sub-system is called

- A) Disk performing
- B) Disk scheduling
- C) Disk storing
- D) Disk extending

..... is the time required to move the disk arm to the required track.

- A) Seek time
- B) Rotational delay
- C) Latency time
- D) Access time

The policy restricts scanning to one direction only.

- A) SCAN
- B) C-SCAN
- C) N-Step SCAN
- D) Both A and B

..... policy selects the disk I/O request that requires the least movement of the disk arm from its current position.

- A) FSCAN
- B) SSTF
- C) SCAN
- D) C-SCAN

..... refers to the ability of an operating system to support multiple threads of execution with a single process.

- A) Multithreading
- B) Multiprocessing
- C) Multiexecuting
- D) Bi-threading

State whether the following statement is true.

- i) It takes less time to terminate a thread than a process.
- ii) Threads enhance efficiency in communication between different executing programs.

- A) i-True, ii-False
- B) i-True, ii-True
- C) i-False, ii-True
- D) i-False, ii-False

..... is a special type of programming language used to provide instructions to the monitor

simple batch processing schema.

- A) Job control language (JCL)
- B) Processing control language (PCL)
- C) Batch control language (BCL)
- D) Monitor control language (MCL)

Answers:

- D) All of the above
- B) 50's
- C) Third
- B) i-True, ii-True
- D) All i, ii, iii, iv and v
- C) Short-term scheduling
- A) demand paging
- B) Segmentation method

- B) Monolithic kernel
- D) Macro kernel
- A) File management
- D) i-c, ii-a, iii-b
- C) Circular waits
- B) Disk scheduling
- A) Seek time
- A) SCAN
- B) SSTF
- A) Multithreading
- B) i-True, ii-True
- A) Job control language (JCL)