Fundamentals of Computer

<https://www.sanfoundry.com/1000-computer-fundamentals-questions-answers/>

<https://www.sanfoundry.com/computer-fundamentals-questions-answers-control-unit/>

<https://www.sanfoundry.com/operating-system-questions-answers-io-subsystem/>

<https://www.sanfoundry.com/computer-organization-mcqs-accessing-io-devices/>

A firewall in a computer network is a system designed to prevent unauthorised access

Translator is the translator programme used in assembly language

Assembly is a computer programme that converts assembly language to machine language

In set associative mapping the data can be mapped anywhere in the cache memory

Full duplex data communication method is used to transmit data over a serial communication link

[Direct Memory Access](https://www.geeksforgeeks.org/direct-memory-access-with-dma-controller-8257-8237/) uses hardware for accessing the memory, that hardware is called a DMA Controller. It has the work of transferring the data between Input Output devices and main memory with very less interaction with the processor. The direct Memory Access Controller is a control unit, which has the work of transferring data.

Token is a piece of information which is sent along with the data to the source computer

1 byte = 8 bits and 1 nibble = 4bits

Data flow is a computer assisted method for the recording analysing of existing or hypothetical systems

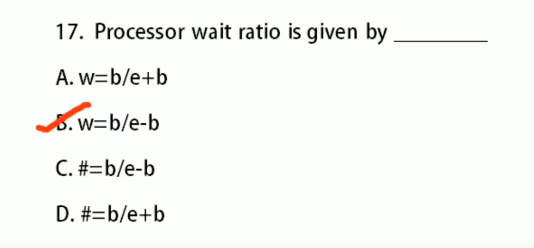
M is a Section of code to which control is transferred by processor is interrupted

The time required for fetching and execution of one simple machine instruction is called CPU cycle

The time for which a piece of equipment operates is called effective time

A technique used by codes to convert an analog signal into a digital bit stream is known as pulse core modulation

Weight fraction is represented by W



Multi programming is a technique that allows more than one programme to be ready for execution and provides ability to switch from 1 process to another

The Access method used for cassette tape is sequential

Pascal is a language which is more suited to a structured programme

The memory that holds microprogram is called Rom

A compiler means a programme which translates source programme into object programme

Dial up is used to connect a remote computer

A single packet on a data link is known as frame

Interrogation is the process of communicating with a file from a terminal

PROLOG is a language used for artificial intelligence

Storage capacity of magnetic desk depends on tracks per inch of surface, bits per inch of track, disk pack in disc surface

The ALU of a computer response to command coming from control section

To produce high quality graphics (hard copy) in colour one will use plotter

The output quality of a printer depends on dots per inch

The stages in the comparison process are - lexical analysis, syntax analysis and code generation

The physical connexion between micro visa memory and other parts of the micro computer disco address

In do while loop the sequence is initialise, execute and test.

The input and output devices are located from central computer facility in batch facing

Hard disc must be partitioned before formatting unlike floppy disc which is directly formatted

Peopleware is a personal designs programmes operates and maintains computer equipment

Interpolation is the estimation of a value of a function at a point beyond the interval in which the data lies

Our programming structure contains specific rules in words that expresses the logical steps of an algorithm

Executing is the process of carrying out commands

The first computer network is Arpanet

The length of IP4 address is 32 bits

The length of MAC address is 48 bits

The length of IPV 6 is 128 bits

USB stands for universal Serial Bus.

IBM1650 was the most popular 1st gen Computer.

First computer name is ENIAC – Electronic numerical integrator and computer

In 3rd generation operating system was developed

Computer Memory

Rom is a static and non volatile memory which means its data is retained even if the device is powered off

Programme stored in Rom are called Firmware (also stored in EPROM or flash memory)

Flash memory(non volatile) is used digital camera

SRAM is very much similar in terms of speed to cache memory, Cache memories implemented using SRAM chips

Cache memory acts as a buffer between main memory and CPU it holds the most frequently used part of data and programme

Cache Memory – When the data at the location in cash is different from the data located in the main memory by cache is called inconsistent

Write policies to avoid cash coherence

write back or write behind - writing is done only to the cache a modified cache block is written back to the store just before it is replaced

Write through - when it is updated it is written to both the cache and the backend storage

Buffered right - a right buffer can be used to hold data being written from the cache to the main memory or to the next cache in the memory hierarchy

Associative mapping is the fastest and most flexible mapping as any block can go into any line of the cache

The transfer between CPU and cache is called word transfer

L2 cache memory resides on the system board

Maurice Wilkes invented cache memory in 1965 The cpu when it needs to access data it will look for the data first in L1 cache

Clock speed is used to measure the speed of the processor

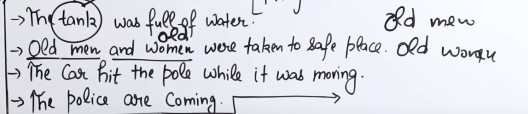
AI

<https://www.sanfoundry.com/1000-neural-networks-questions-answers/>

<https://www.sanfoundry.com/artificial-intelligence-questions-answers/>

Natural language processing has two field understanding and generation.

Ambiguity in NLP – Lexical, Syntactic, Semantic, Pragmatic Ambiguity.



NLU – Natural Language Understanding

NLG – Natural Language Generation.

A hybrid Bayesian network assists of both discrete and continuous variables

Unify algorithm uses two sentences as input and returns a unifier

Exploratory learning is another name for unsupervised learning

There are four informed search method in artificial intelligence and they are best first search,

Greedy best first search A\* search and memory bounded neuristic search

Total number of proposition symbols in AI are 2 i.e. True and False.

There are 5 logical symbols in Ai - Negation, conjunction, disjunction, implication, and biconditional

Physiologic is the name of artificial intelligence which allows machines to handle vague information with a deftness that mimics human intuition

Alan Turing introduced a test to determine whether a machine can think like a human or not which means it can demonstrate intelligence known as the turing test (Imitation game) in 1950.

The process of artificial intelligence is categorised into three parts sensor reasoning and action

5AI agents goal based AI agent, learning AI agent, simple reflects AI agent, utility based agent, model based reflex AI agent

Automated vehicle is an example of supervised learning

Lisp is the second oldest high level programming language still in common use after Fortran

The concept of state space search is widely used in artificial intelligence

The PEAS In the task environment is about performance involvement actuators and sensors on which AI agents work.

Self organising feature map is an example of unsupervised modern networks

Genetic algo mimics the evolutionary process to generate increasingly better solutions to a process to a problem.

Logistic regression and back propagation are classification algo.

For time series data analysis and supervised learning simple recruiting networks is used.

Back propagation is an example of supervised neural network.

In neural network the network capacity is defined as the number of patterns that can be stored and recalled in a network.

Machine learning is the autonomous acquisition of knowledge through the use of computer programs.

Reinforcement learning applications – Real time decision making, Game ai, learning tasks, skill acquisition, robot navigation.

Unsupervised learning - Clustering – Targeted marketing, recommended systems and customer segmentation.

Supervised Classification - Fraud Detection +, Image classification , Diagnostic and customer retention.

K- mean algo – k is number of clusters.

Logistic regression is used to predict dependent variable with 2 diff values.

Distance metric used for categorical variables to finding the closest neighbour.- Hamming Distance.4

Continuous neighbour – Euclidean, Manhattan, minkowski

A\* search is an example of Heuristic search or informed search

Big data

<https://www.sanfoundry.com/bigdata-questions-answers/>

<https://www.sanfoundry.com/1000-hadoop-questions-answers/>

Operational Environment is the source of all data warehouse data

Fact tables are hdfs, Mapreduce,YARN

Reconciled data is the current data intended to be the single source for all the decision support system

Secondary namenode acts as a checkpoint in HDFS

Queryable change data is the most common source of change data in regressing a data warehouse

There are two different approaches to integrating heterogeneous databases in data warehousing.

Query Driven Approach. Update Driven Approach

Hadoop is an open source framework for storing data and running application clusters of commodity hardware

HDFS stores 256 unit data in each clusters that can be scaled anytime

Hadoop runs on cross platform

Fixed size piece of Mapreduce job is known as splits

Mapper is a generic type

Small logical units where data warehouse hold large amount to detest known as datamarts

Computer Networks

<https://www.indiabix.com/computer-science/networking/>

Router works in Layer 3 Network layer. It is a device that forwards packets between networks with processing the routing information included in the packet.

The resources needed for communication between end systems are reserved for the duration of session between end systems in circuit switching. A telephone network is an example of circuit switched.

IPV4 = 32bits, IPV6 = 128bits, MAC Address = 48bits

Natural mask for class C Network – 225.225.225.1

Network Layer – Packets

In TDM Slots are for divided into frames

A data link player takes a packet from network layer and encapsulates them into frames for transmission

Physical Layer – Bit to bit, Transport Layer – Process to Process, End to End, Segmentation and concatenation.

Delimiting and synchronization of data exchange is provided by session layer

Mail services are available to network users through application layer

Semantics define how particular pattern to be interpreted and what access to be taken based on its interpretation, Send text refers to the structure format of the data meaning the order in which they are presented

When data are transmitted from device A to device B, the header from A’s Layer 4 is read by B’s Transport Layer.

encryption and decryption are function of presentation layer

Deliver mass look right application program running on most the port address must be consulted

ICMPv6 includes IGMP and ARP

Datalink layer is responsible for moving frames from hop (node) to the next

Data link layer does framing, error control, flow control

Header of a frame contains synchronization bits, addresses, frame identifier

Automatic repeat request error management mechanism is provided by logical link control sub layer

When two or more bids in a data unit has been changed during the transmission the error is called burst error

Routing algorithms that can be used for network here designs are shortest path algorithm, distance vector routing, link state routing

Address resolution protocol ARP is this possible for converting the higher level protocol address that is IP addresses to physical network addresses

UDP and TCP – Transport Layer.

Circuit Switching – Physical Layer

Data Link is responsible for moving frames from one node to the next, It is responsible for transporting data units from workstation to other stations without error

Resolvers are programs that run on DNS clients and DNS servers and that create queries to extract information from name servers

IP or Logical Address to MAC or Physical Address – ARP

Network layer converts packets into frames and frames into packets, it is used to carry data from one host to another.

Data link layer converts raw bits to French frames to raw bits

Network layer uniquely identifies hosts beyond the subnet and defines the path that the packet will follow to reach the destination

Ethernet uses a 6 byte physical address which is marked on the NIC

Telent Is used for remote terminal connection service

Operating System

<https://www.indiabix.com/computer-science/operating-systems-concepts/>

Real addressing is a technique in which cpu generates physical addresses directly

The wait operation of the semaphore basically works on the basic block() system call

Paging increases the Context -switch time.

Ready state process means when a process is scheduled to run after some execution

Resources which can be taken away from a process without causing any ill effects the process are called preemptive process,

The strategy of making processes that are logically unable to be temporarily suspended is called preemptive scheduling

In UNIX fork system call is used to create new process

With Paging, Physical memory is broken into fixed-sized blocks called frames. Logical memory is also broken into blocks of the same size called pages.

Physical memory is the amount of RAM (Random Access Memory) in a computer. Logical memory is the amount of memory an operating system makes available to a program or process

In segmentation each address is specified by a segment number and offset

A process set to be in deadlock state if it was waiting for an event that will never occur

The entry of all the PCB of the current process is in process table

UNIX each process is defined by its process identifier

PCB is also known as Task Control Block.

The switching of the cpu from one process or thread to another is called context switch task switch process switch

The dispatcher takes and gives processes the cpu and the time it takes for it to stop one process and start with the running is known as dispatch latency.

I/O bound program have many short CPU bursts

COU bound program have few long CPU bursts.

CPU Scheduling is the basis of Multiprogramming OS.

SC used very large time slice round robins converts into first come first serve algorithm

SJF minimises the process flow time, it is also a special case for general priority scheduling algorithm, it uses bursts time.

Priority Algorithms give minimum average waiting time,It also have indefinite blocking(solved through aging) and starvation.

Round Robin Scheduling is best for timesharing systems. It will simply put the new process at the tail of the ready queue.

Long term scheduler selects business process has to be brought in the ready queue and it controls the degree of multi programming (number of process in ready queue).

Short term schedular selects which process will be executed

Medium Durham scheduler it select which process to remove from memory by swap in

Threads does NOT share PC and Stack.

With paging there is no external fragmentation

Illegal addresses part of using valid invalid bid

The main function of the command interpreted is to get and execute the next user’s specified command

In real mode can only one program be executed at one time.

Short term schedular is responsible for CPU scheduling

The process scheduled in the process management unit selects a process to run

Block cash and buffer cache are used to improve disk performance

The OS as a devices management keeps track of devices, channels, Control units is called as I/O traffic controller.

Instruction set architecture decided the minimum number of frames be allocated to a process.

A process is copied into the MM from SM – Demand Paging

Someone unfortunate sequence of events might lead to deadlock this implies an unsafe state

Utility program is an interrupt handler

What else is an command integrator called? SHELL

My cycler weight condition can be prevented by defining a linear ordering of resources type

The address of a page table in memory is pointed by page table base register

Shortest Seek time first SSTF can lead to starvation.

FIFO suffers Belady’s anamoly

DSA

<https://www.sanfoundry.com/discrete-mathematics-mcqs-complexity-algorithms/>

C Programming

<https://www.indiabix.com/c-programming/questions-and-answers/>

C++ Programming

https://www.indiabix.com/cpp-programming/oops-concepts/

Oops is a programming technique that employs objects rather than just functions and procedures

Abstraction is the method of hiding unnecessary details from the necessary ones.

Encapsulation is the process of binding data members and methods of program together to do a special job without revealing unnecessary details.

Types of encapsulations

Data hiding is a process of hiding unwanted information such as restricting access to any member of an object by making it private

Data binding means it binds the data members in the methods together as a home as a class to be precise

Cout is an Object of class ostream.

**Ad-hoc Polymorphism, also called as Overloading Ad-hoc Polymorphism allows functions having same name to act differently for different types. It best describes Function Overloading**