Operating System Questions & Answers – File System Implementation – Allocation Methods – 1

This set of Operating System Multiple Choice Questions & Answers (MCQs) focuses on “Allocation Methods – 1”.

1. The three major methods of allocating disk space that are in wide use are _____

a) contiguous

b) linked

c) indexed

d) all of the mentioned

Answer: d

2. In contiguous allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

Answer: a

3. In linked allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

Answer: b

4. In indexed allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

Answer: c

5. On systems where there are multiple operating system, the decision to load a particular one is done by _____

a) boot loader

b) bootstrap

c) process control block

d) file control block

Answer: a

6. The VFS (virtual file system) activates file system specific operations to handle local requests according to their _____

a) size

b) commands

c) timings

d) file system types

Answer: d

7. What is the real disadvantage of a linear list of directory entries?

a) size of the linear list in memory

b) linear search to find a file

c) it is not reliable

d) all of the mentioned

Answer: b

8. Contiguous allocation of a file is defined by _____

a) disk address of the first block & length

b) length & size of the block

c) size of the block

d) total size of the file

Answer: a

9. One difficulty of contiguous allocation is _____

a) finding space for a new file

b) inefficient

c) costly

d) time taking

Answer: a

10. _____ and _____ are the most common strategies used to select a free hole from the set of available holes.

a) First fit, Best fit

b) Worst fit, First fit

c) Best fit, Worst fit

d) None of the mentioned

Answer: a

11. The first fit and best fit algorithms suffer from _____

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

Answer: b

12. To solve the problem of external fragmentation _____ needs to be done periodically.

a) compaction

b) check

c) formatting

d) replacing memory

Answer: a

13. If too little space is allocated to a file _____

a) the file will not work

b) there will not be any space for the data, as the FCB takes it all

c) the file cannot be extended

d) the file cannot be opened

Answer: c

Allocation Methods – 2".

1. A device driver can be thought of like a translator. Its input consists of _____ commands and output consists of _____ instructions.

a) high level, low level

b) low level, high level

c) complex, simple

d) low level, complex

View Answer

Answer: a

Explanation: None.

2. The file organization module knows about _____

a) files

b) logical blocks of files

c) physical blocks of files

d) all of the mentioned

View Answer

Answer: d

Explanation: None.

3. Metadata includes _____

a) all of the file system structure

b) contents of files

c) both file system structure and contents of files

d) none of the mentioned

View Answer

Answer: c

Explanation: None.

4. For each file there exists a _____ that contains information about the file, including ownership, permissions and location of the file contents.

a) metadata

b) file control block

c) process control block

d) all of the mentioned

View Answer

Answer: b

Explanation: None.

5. For processes to request access to file contents, they need _____

a) to run a seperate program

b) special interrupts

c) to implement the open and close system calls

d) none of the mentioned

View Answer

Answer: c

Explanation: None.

6. During compaction time, other normal system operations _____ be permitted.

a) can

b) cannot

c) is

d) none of the mentioned

View Answer

Answer: b

Explanation: None.

7. When in contiguous allocation the space cannot be extended easily?

a) the contents of the file have to be copied to a new space, a larger hole

b) the file gets destroyed

c) the file will get formatted and lost all its data

d) none of the mentioned

View Answer

Answer: a

Explanation: None.

8. In the linked allocation, the directory contains a pointer to which block?

I. first block

II. last block

a) I only

b) II only

c) Both I and II

d) Neither I nor II

View Answer

Answer: c

Explanation: None.

9. There is no _____ with linked allocation.

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

View Answer

Answer: b

Explanation: None.

10. What is the major disadvantage with a linked allocation?

a) internal fragmentation

b) external fragmentation

c) there is no sequential access

d) there is only sequential access

View Answer

Answer: d

Explanation: None.

11. What if a pointer is lost or damaged in a linked allocation?

a) the entire file could get damaged

b) only a part of the file would be affected

c) there would not be any problems

d) none of the mentioned

View Answer

Answer: a

Explanation: None.

12. FAT stands for _____

a) File Attribute Transport

b) File Allocation Table

c) Fork At Time

d) None of the mentioned

View Answer

Answer: b

Explanation: None.

13. By using FAT, random access time is _____

a) the same

b) increased

c) decreased

d) not affected

View Answer

Answer: c

Explanation: None.

This set of Operating System Puzzles focuses on “File System Implementation – Allocation Methods – 3”.

1. A better way of contiguous allocation to extend the file size is _____

a) adding an extent (another chunk of contiguous space)

b) adding an index table to the first contiguous block

c) adding pointers into the first contiguous block

d) none of the mentioned

View Answer

Answer: a

Explanation: None.

2. If the extents are too large, then what is the problem that comes in?

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

View Answer

Answer: a

Explanation: None.

3. The FAT is used much as a _____

a) stack

b) linked list

c) data

d) pointer

View Answer

Answer: b

Explanation: None.

4. A section of disk at the beginning of each partition is set aside to contain the table in _____

a) fat

b) linked allocation

c) hashed allocation

d) indexed allocation

View Answer

Answer: a

Explanation: None.

5. Contiguous allocation has two problems _____ and _____ that linked allocation solves.

a) external – fragmentation & size – declaration

b) internal – fragmentation & external – fragmentation

c) size – declaration & internal – fragmentation

d) memory – allocation & size – declaration

View Answer

Answer: a

Explanation: None.

6. Each _____ has its own index block.

a) partition

b) address

c) file

d) all of the mentioned

View Answer

Answer: c

Explanation: None.

7. Indexed allocation _____ direct access.

a) supports

b) does not support

c) is not related to

d) none of the mentioned

View Answer

Answer: a

Explanation: None.

8. The pointer overhead of indexed allocation is generally _____ the pointer overhead of linked allocation.

a) less than

b) equal to

c) greater than

d) keeps varying with

View Answer

Answer: c

Explanation: None.

9. For any type of access, contiguous allocation requires _____ access to get a disk block.

a) only one

b) at least two

c) exactly two

d) none of the mentioned

View Answer

Answer: a

Explanation: We can easily keep the initial address of the file in memory and calculate immediately the disk address of the ith block and read it directly.

10. Consider a disk where blocks 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 17, 18, 25, 26 and 27 are free and the rest of the blocks are allocated. Then the free space bitmap would be _____

a) 10000110000001110011111100011111…

b) 11000011000000111001111110001111 1…

c) 01111001111110001100000011100000…

d) 00111100111111000110000001110000 0…

View Answer

Answer: d

Explanation: None.

Inodes:-

1. An “Inode” represents

a) Buffer

b) Data

c) Files & Directories

d) None of the mentioned

View Answer

Answer: c

2. Journaling is preferred for

a) Faster file system recovery

b) Faster write operation

c) Storing logs

d) Storing metadata

View Answer

Answer: a

3. Examples of Journaling filesystem

a) Ext2

b) Ext3

c) UFS

d) JFS

View Answer

Answer: b

4. Hard links & soft links are same

a) TRUE

b) FALSE

View Answer

Answer: b

5. ACL stands for

a) ACCESS control list

b) ACCESS check list

c) Audit control list

d) Audit check list

View Answer

Answer: a

6. VFS

a) Standalone filesystem

b) Support multiple filesystem type

c) Network filesystem

d) None of the mentioned

View Answer

Answer: b

7. Buffer cache helps to

a) Store data

b) Improved read/write performance

c) Allocate memory

d) None of the mentioned

View Answer

Answer: b

8. Wear leveling affects

a) Hard disk

b) Flash

c) Optical storage

d) RAM

View Answer

Answer: b

9. Deframentation is the process of

a) physically reorganizing the contents of the disk to store the pieces of each file close together and contiguously

b) Create extra space in filesystem

c) Resizing the filesystem

d) None of the mentioned

View Answer

Answer: a

10. The Superblock is required for

a) Description of the basic size and shape of this file system

b) This is the inode number of the first inode in the file system

c) The number of free blocks in the file system

d) All of the mentioned

View Answer

Answer: d

Directories :-

1. Which command is used for printing the current working directory?

a) HOME

b) cd

c) pwd

d) dir

View Answer

Answer: c

Explanation: pwd command is used for checking our current directory. Current directory is the directory in which we are currently working. pwd displays the absolute pathname i.e. with respect to the root directory.

$ pwd

/home/user06/Abdullah

2. Which command is used for changing the current directory?

a) cd

b) cp

c) pwd

d) rm

View Answer

Answer: a

Explanation: cd (change directory) command is used for moving around the file system. cd command is usually invoked with a argument. After invocation, it changes the current directory to the directory specified as argument. Cp command is used for copying files while rm command is used for deleting files.

For example: our current directory is /bin/user06 and we want to change our directory to a directory named dir_one which is inside the user06 directory. To do so, type the following:

$ cd dir_one

$pwd

/bin/user06/dir_one

3. cd command cannot be used without any argument.

a) True

b) False

View Answer

Answer:b

4. Which command is used for creating directories?

a) rmdir

b) mkdir

c) cd

d) cp

View Answer

Answer: b

Explanation: Directories in UNIX are created using mkdir command. The name of the directory to be created is specified as an argument to the mkdir command. For example, to create a dir named dir_01 in the current directory we can use the following command,

$ mkdir dir_01

5. We can create multiple directories by single invocation of mkdir command.

a) True

b) False

View Answer

Answer: a

Explanation: Multiple directories can be created by one mkdir command

$ mkdir dir_01 dir_02 dir_03

6. What does the following command do?

```
$ mkdir dir   dir/dir_01/dir_02
```

a) create dir, dir_01 and dir_02

b) creates dir_02

c) creates dir only

d) throws an error

View Answer

Answer: a

Explanation: The above command first creates a directory named dir and after that it creates a subdirectory dir_01 under dir. At last, it creates another subdirectory dir_02 under dir_01. Thus a directory tree is formed in which directory dir is the parent directory and dir_01, dir_02 are subdirectories.

7. Sometimes we are unable to create a directory because _____

a) the directory may already exist in the current directory

b) there may be an ordinary file by the same name in the current directory

c) the permissions set for the current directory does not allow the creation

d) the directory may exist, there may be an ordinary file, the permissions set for the current directory does not allow the creation

View Answer

Answer: d

Explanation: Sometimes we are not able to create directory because of multiple reasons as stated above.

8. Which command is used for removing an empty directory?

a) mkdir

b) rmdir

c) del

d) remove

View Answer

Answer: b

Explanation: rmdir command is used for removing directories provided the directory should be empty. For example, to remove a directory named dir_001 in the current directory type the following command on the terminal.

$ rmdir dir_001

9. Multiple directories can be removed using single rmdir command.

a) True

b) False

View Answer

Answer: a

Explanation: Like mkdir command, we can delete multiple directories using one shot of rmdir command. While deleting directories and subdirectories, a reverse logic is applied i.e. first the subdirectories or the child directories are removed and then their parent directories.

$ rmdir dir   dir/dir_01/dir_02

10. For creating or removing directories, the user must be positioned above the directory or in the parent directory of the directory, on which the operation is to perform.

a) True

b) False

View Answer

Answer: a

Explanation: For performing any operation on the file system, the user must be hierarchically above the directory or should be in parent directory of the directory on which the operation is to be performed. Without following this rule, the user will not be able to perform any operation on the file system.

11. If rmdir dir001 fails, what could be the reason(s)?

a) dir001 doesn't exist

b) dir001 is not empty

c) permissions of dir001 doesn't allow to remove it

d) dir001 doesn't exist, dir001 is not empty and permissions of dir001 doesn't allow to remove it

View Answer

Answer: d

Explanation: There could be multiple reasons which could lead to failure while removing a directory. Major reasons could be:

-> directory doesn't exists.

-> directory is not empty.

-> permissions of directory doesn't allow to remove it.

12. pwd and echo $HOME will display the same output.

a) True

b) False

View Answer

Answer: b

Explanation: pwd is used for displaying the absolute pathname of our current working dircectory while $HOME displays the absolute pathname of our home directory.

$ echo $HOME

/home/user08 // displays home directory

$ pwd

Other file types:-

1. A file is a container for storing information.

a) True

b) False

View Answer

Answer: a

Explanation: We can define a file as a stream of characters or a container for storing information. While working in a UNIX environment, we came across three categories of files which are classified as- ordinary file, directory file and device file.

2. In how many broad categories, files are divided into UNIX?

a) 2

b) 4

c) 5

d) 3

View Answer

Answer: d

Explanation: Files are divided into three major categories i.e. ordinary file, directory file and device file. The characteristics of these three categories of files differ from each other and each category has a predefined use.

3. In UNIX, the file name and file size are stored in the file itself.

a) True

b) False

View Answer

Answer: b

Explanation: A UNIX file's size is not stored in the file, nor its name. All this information is stored separately in a separate area of hard disk which is not directly accessible to humans, but only to the kernel.

4. The most common file type is ___

a) ordinary file

b) directory file

c) device file

d) ordinary file and directory file

View Answer

Answer: a

Explanation: The most common file type is an ordinary file or a regular file. It contains data as a stream of characters. Ordinary files are also of two types, text file and binary file.

5. What is a directory file?

a) a directory containing data

b) a directory containing details of the files and subdirectories it contains

c) a directory contains files

d) a directory containing data and files

View Answer

Answer: b

Explanation: A directory file contains no data but some details of the subdirectories and files that it contains. Directory files contain an entry for every file and subdirectory in it and each entry has some necessary information regarding files and subdirectories.

6. Each entry of directory file has component(s) namely _____

a) filename

b) inode number

c) filename and inode number

d) file size

View Answer

Answer: c

Explanation: Every entry of the directory file contains information about files and subdirectories and each entry has two components:

-> Filename

-> A unique identification number (called inode number).

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7. Device files are used by the kernel for operating the device.

a) True

b) False

View Answer

Answer: a

Explanation: Device files are nothing but special files which does not contain a stream of characters but some attributes related to the devices which govern the operation of a device. The kernel reads this file for the attributes to perform operations on any device.

8. When we log in, the UNIX places us in a directory, called _____ directory

a) home

b) main

c) parent

d) current

View Answer

Answer: a

Explanation: When we log in, the system automatically places us in a directory called Home directory. We can change our directory if we want and can also view our home directory using the shell variable, HOME.

9. UNIX treats everything as a file.

a) True

b) False

View Answer

Answer: a

Explanation: All physical devices such as printers, hard disk are treated as files by the UNIX system. Even the kernel, shell and main memory is treated as a file by UNIX operating system.

10. The root directory is represented by ___

a) \

b) /

c) *

d) $

View Answer

Answer: b

Explanation: The root directory (/) serves as a reference point for all the files. All the files are hierarchically below it. All files in UNIX are related to one another. The file system in UNIX is a collection of all these related files (ordinary, directory and device files) organized in a hierarchical manner.

11. UNIX imposes no rule for framing filename extensions.

a) True

b) False

View Answer

Answer: a

Explanation: UNIX imposes no rules for framing filename extensions. For example, a shell script doesn't need to have the .sh implication, even though it helps in identification. In all cases, it's the application that imposes the restriction. For example, C compiler expects C program filenames to end with .c .

12. _____ and _____ cannot be used in a filename.

a) /, NULL

b) $,^

c) ., %

d) NULL, $

View Answer

Answer: a

Explanation: UNIX imposes no rules in framing filename extensions but there are some special characters which cannot be used while naming a file. / and NULL are the characters which cannot be used in a filename.

13. Filenames in UNIX are not case-sensitive.

a) True

b) False

View Answer

Answer: b

Explanation: Since UNIX is sensitive to case, filenames are also. Hence, chap01, Chap01 and CHAP01 are three different files and can exist in the same directory.

14. We should avoid filenames starting with a – (hyphen).

a) True

b) False

View Answer

Answer: a

Explanation: Those files which have filename starting with a (-) are difficult to remove and many commands can interpret such filename as an option which could lead to a miserable situation.

File Management Systems".

1. MFD stands for?

a) Main File Directory

b) Memory File Directory

c) Master File Directory

d) Master Format Directory

Answer: c

Explanation: MFD is Master File Directory. MFD lists names and characteristics of every file in volume. It also lists any subdirectories.

2. The users are allowed to read information in directories.

a) True

b) False

Answer: a

Explanation: The statement is true. Directories maintain the hierarchical structure of the file system.

3. _____ is created when a user opens an account in the computer system.

a) RFD

b) Subdirectory

c) MFD

d) SFD

Answer: b

Explanation: A subdirectory is created when a user opens an account in the computer system. It is treated as a file, though flagged in MFD as subdirectory.

4. A filename without path information.

a) File name

b) Complete filename

c) Directory name

d) Relative filename

Answer: d

Explanation: The answer is Relative filename. A relative filename is a name without path information. It appears in the directory listings, folders.

5. Two or three characters appended to relative filename separated by a period.

a) status

b) identifier

c) extension

d) descriptor

Answer: c

Explanation: Extensions are added to filenames. The extensions help in identifying the file type.

6. Files that maintain the hierarchical structure of the file system.

a) Descriptors

b) Directories

c) Modifiers

d) Relative files

Answer: b

Explanation: Directories are the files that maintain the hierarchical structure of the file system. The users are allowed to read information in directories.

7. Files in which users store information?

a) Info files

b) Ordinary files

c) Special files

d) Complex files

Answer: b

Explanation: The answer is Ordinary files. Users store information in ordinary files. Their protections is based on user requests and are related to various file functions.

8. The files that appear as entries in the directories.

a) Ordinary files

b) Special files

c) Duplicate files

d) Sub directories

Answer: b

Explanation: The special files appear as entries in the directories. They are the device drivers providing i/O hardware interface.

9. Number of regions of the disk in a UNIX files management system.

a) 1

b) 2

c) 3

d) 4

Answer: d

Explanation: There are 4 regions in which the disk is divided. The first is for booting, second contains the disk size, third includes the list of definitions and the remaining region contains the free blocks available.

10. Several instructions execution simultaneously in _____

a) processing

b) parallel processing

c) serial processing

d) multitasking

Answer: b

Explanation: The answer is parallel processing. In parallel processing, the several instructions are executed simultaneously

Filesystem Questions & Answers

This set of multiple choice SAN storage questions and answers focuses on Filesystems.

1. An “Inode” represents

a) Buffer

b) Data

c) Files & Directories

d) None of the mentioned

View Answer

Answer: c

2. Journaling is preferred for

a) Faster file system recovery

b) Faster write operation

c) Storing logs

d) Storing metadata

View Answer

Answer: a

3. Examples of Journaling filesystem

a) Ext2

b) Ext3

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View Answer

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a) TRUE

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a) ACCESS control list

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Answer: a

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a) physically reorganizing the contents of the disk to store the pieces of each file close together and contiguously

b) Create extra space in filesystem

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Answer: a

10. The Superblock is required for

a) Description of the basic size and shape of this file system

b) This is the inode number of the first inode in the file system

c) The number of free blocks in the file system

d) All of the mentioned

View Answer

Answer: d

Unix Questions and Answers – Introduction to UNIX

This set of Unix Multiple Choice Questions & Answers (MCQs) focuses on “UNIX”.

1. What is UNIX?

a) an operating system

b) a text editor

c) programming language

d) software program

View Answer

Answer: a

Explanation: UNIX is an operating system developed in the early 1970's at Bell Labs by Dennis Ritchie, Ken Thompson, and others. It is a multiuser, multitasking and timesharing operating system. The power of UNIX is derived from its commands and their multiple options.

2. In which language UNIX is written?

a) JAVA

b) Python

c) C++

d) C

View Answer

Answer: d

Explanation: UNIX was originally written in Assembly language but Dennis Ritchie and Ken Thompson wanted an operating system which could run on more than one type of hardware. So in 1973, they rewrote the whole operating system in C language due to which one of the strongest features i.e. portability was added to the operating system.

3. Which of the following is not a feature of UNIX?

a) multitasking

b) multiuser

c) portability

d) easy to use

View Answer

Answer: d

Explanation: UNIX is a multitasking operating system i.e. a user can run multiple tasks concurrently. Similarly, it is a multiuser system because it permits working with multiple users on a single operating system. But a major disadvantage of UNIX lies in the fact that the richness provided by its commands

requires a special type of commitment to understand the subject. i.e. the user must be well aware of commands he is using and the functions performed by them.

4. Which of the following is not a part of all the versions of UNIX?

a) Kernel and Shell

b) Commands and utilities

c) Graphical user interface

d) System Calls

View Answer

Answer: c

Explanation: The kernel is the heart of the operating system while the shell is the utility which processes our requests. While system calls are a handful of functions which are used to interact with the kernel and make available the services provided by the operating system. A Graphical user interface (GUI) is available in UNIX, but the traditional UNIX interface is the command line only.

5. Which of the following is not true about UNIX?

a) Many people can use a UNIX based computer at the same time; hence UNIX is called as a multiuser system

b) A user can run multiple programs at the same time; hence UNIX is called a multitasking environment

c) UNIX was not written in ‘C’ language

d) Linux is also known as a version of UNIX

View Answer

Answer: c

Explanation: One of the most attractive features of UNIX is that it supports multi-user and multitasking environment which makes it so popular among its users. There are many UNIX variants available in the market. Solaris Unix, AIX, HP Unix, BSD are some of the examples. Linux is also a flavor of UNIX which is freely available. Unix was developed in 1969 by AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs and was written in ‘C’.

6. POSIX is a set of standards specified for establishing compatibility between operating systems.

a) True

b) False

View Answer

Answer: a

Explanation: POSIX- Portable Operating System Interface for Computer Environment is basically a set of standards specified by IEEE for establishing compatibility between operating systems, especially which are UNIX based. For example, if we write a program relying on POSIX standards, we can easily port it among a large family of Unix derivatives (including Linux).

7. Shell is a command interpreter used for interacting with a UNIX system.

a) True

b) False

View Answer

Answer: a

Explanation: Computers don’t have any capability of translating commands into actions. To do so we require shell-a command interpreter which translates our commands into actions. It is actually the interface between the user and kernel. There could be multiple shells in action on a single system.

8. Which part of the UNIX operating system interacts with the hardware?

a) Kernel

b) Shell

c) vi editor

d) application program

View Answer

Answer: a

Explanation: The kernel is the core of the operating system. It is a collection of routines written in C which directly communicates with the hardware. User programs that need to interact with the hardware access the services of the kernel. There is only one kernel running on a system, unlike shells which can be multiple.

9. Two UNIX systems may or may not use the same set of system calls.

a) True

b) False

View Answer

Answer: b

Explanation: All UNIX flavors have one thing in common, they use the same system calls which are described in POSIX specification.

10. What is a superuser?

a) system manager

b) normal user

c) administrator

d) a user with special rights

View Answer

Answer: a

Explanation: A superuser (root) is the UNIX system manager which can perform special tasks like killing any executing program, resetting other users passwords, change users permissions and performing other system management tasks. The administrator can switch to superuser by issuing su command.

11. What is the windowing system of UNIX known as?

a) X Window system

b) LINUX

c) Red Hat

d) DOS

View Answer

Answer: a

Explanation: The X window system, commonly known as X, is a windowing system developed at MIT. It is an open-source, network transparent, client-server based system that provides a Graphical user interface. X is primarily used on UNIX variants but it is also available for other operating systems also