

**YOU HAVE TO ANSWER ALL QUESTION**

**Question 1: Choose (*Shade*) the correct answer. (17 Marks, 1 for each)**

1. I/O a major factor in system performance since it is stand for \_\_\_\_\_
  - ① Context switches due to interrupts
  - ② Data copying
  - ③ Network traffic especially stressful
  - ④ Answers 1, 2, &3
2. Virtual memory can be implemented via Demand \_\_\_\_\_
  - ① Paging
  - ② Segmentation
  - ③ Answers 1 & 2
  - ④ None of previous
3. Sequential Access and Direct Access are methods to access \_\_\_\_\_
  - ① File system
  - ② Virtual memory
  - ③ physical meshademory
  - ④ Answers 2 & 3
4. File system organized into \_\_\_\_\_
  - ① Layers
  - ② Flowers
  - ③ Answers 1 & 2
  - ④ None of previous
5. Allocation methods refer to how disk blocks are allocated for files that are \_\_\_\_\_
  - ① Contiguous and Indexed
  - ② Contiguous, Linked and Indexed
  - ③ Contiguous and Linked
  - ④ None of previous
6. Methods such as \_\_\_\_\_ sparing used to handle bad blocks
  - ① Cylinder
  - ② Sector
  - ③ Head
  - ④ Arm
7. Swap-space is a \_\_\_\_\_ uses disk space as an extension of main memory
  - ① File system
  - ② Virtual memory
  - ③ Physical memory
  - ④ None of previous
8. \_\_\_\_\_ bring a page into memory only when it is needed
  - ① Demand Paging
  - ② Swapping-out
  - ③ Scheduling
  - ④ None of previous
9. \_\_\_\_\_ is never swaps a page into memory unless page will be needed
  - ① Lazy scanner
  - ② Lazy swapper
  - ③ Lazy handler
  - ④ None of previous
10. Copy-on-Write allows \_\_\_\_\_ processes to initially share the same pages in memory
  - ① Parent
  - ② Child
  - ③ Answers 1 & 2
  - ④ None of previous

11. \_\_\_\_\_ uses modify (dirty) bit to reduce overhead of page transfers  
 ① Segmentation    ② Paging replacement    ③ Answers 1 & 2    ④ None of previous
12. \_\_\_\_\_ is a fast memory holding copy of data and is a key of performance  
 ① Reservation    ② Spooling    ③ Caching    ④ Answers 1 & 3
13. \_\_\_\_\_ is a process is busy swapping pages in and out  
 ① Thrashing    ② Segmentation    ③ Lazy swapper    ④ None of previous
14. \_\_\_\_\_ Is store data in memory while transferring between devices  
 ① Swapping    ② Buffering    ③ Defragmenting    ④ None of previous
15. Mainly used for backup, storage of infrequently-used data, transfer medium between systems  
 ① Magnetic tape    ② SCSI Driver    ③ SCSI Zip Drive    ④ Answers 2 & 3
16. Dividing a disk into sectors that the disk controller can read and write known as \_\_\_\_\_  
 ① Segmentation    ② Logical formating    ③ Physical formating  
 ④ Answers 2 & 3
17. \_\_\_\_\_ is a virtual memory uses disk space as an extension of main memory  
 ① RAID Disc    ② Magnetic tape    ③ Swap space    ④ Answers 1 & 3

**Question 2: Assume we have 3 frames and consider this reference string : 5, 7, 6, 0, 7, 1, 7, 2, 0, 1, 7, 1, 0**  
**Show the content of memory after each memory reference if Optimal page replacement algorithm is used. Find also the number of page faults. (5 Marks)**

**Question 3: Identify which statement is True and which is False. (25 Marks, 1 for each)**

1. \_\_\_\_\_ All pages could be pre-paged in page fault algorithms.
2. \_\_\_\_\_ A page cache caches pages rather than disk blocks using virtual memory techniques.
3. \_\_\_\_\_ OS can't recover from disk read, device unavailable, or transient write failures.
4. \_\_\_\_\_ Multimedia systems don't require hard realtime scheduling to ensure critical tasks will be serviced within timing deadlines.
5. \_\_\_\_\_ While swap (raw) disk or partition normally without a file system, formatted with a file system.
6. \_\_\_\_\_ A file system must be mounted before it can be accessed.
7. \_\_\_\_\_ Physical address allows address spaces to be shared by several processes.
8. \_\_\_\_\_ Two parts of any program need to be in memory for execution.
9. \_\_\_\_\_ During address translation, if valid-invalid bit in page table entry is invalid this causes page swap.
10. \_\_\_\_\_ In Operating Systems, large virtual memory can be provided on a smaller physical memory.
11. \_\_\_\_\_ The information in a file is defined by its creator.
12. \_\_\_\_\_ Information about files are kept in the directory structure.
13. \_\_\_\_\_ File is an abstract data type.
14. \_\_\_\_\_ Efficiency, Naming, and Grouping are three characteristics to organize the directory logically.
15. \_\_\_\_\_ The function of device driver is controlling the virtual device.
16. \_\_\_\_\_ Boot control block contains info needed by system to boot OS from that volume.
17. \_\_\_\_\_ Hash table is a linear list with hash data structure for directory implementation.
18. \_\_\_\_\_ Disk cache is separate section of main memory for frequently used blocks.
19. \_\_\_\_\_ Text file is a series of code sections that the loader can bring into memory and execute.

20. \_\_\_\_\_ Efficiency depends on disk allocation and directory algorithms only and “types of data kept in file’s directory entry” is not related.
21. \_\_\_\_\_ Disk cache is very important to increase performance of file access.
22. \_\_\_\_\_ Same page may be brought into memory several times in page replacement algorithms.
23. \_\_\_\_\_ Victim frame is the frame that selected to swap-in if there is no free frame in memory.
24. \_\_\_\_\_ Prepaging use to reduce the large number of page faults that occurs at process startup.
25. \_\_\_\_\_ The Optimal algorithm idea is “replace page that will not be used for shortest period of time.

**Question 4: List 5 for the following part file Operation/Attributes: (5 marks, ½ for each)**

**i. File operations.**

**ii. File attributes.**

**Question 5: Discuss the following: (6 marks, 3 for each)**

**i. Goals of Protection (use point style)**

**ii. Guiding principle of protection**

**Question 6: There are three general methods for delivering content from a server to a client across a network. Identify which description is for which term. (3 marks, 1 for each)**

1. The server delivers the content to all clients, regardless whether they want the content or not.
2. The server delivers the content to a single client.
3. The server delivers the content to a group of receivers who indicate they wish to receive the content.

**Unicasting**

**Broadcasting**

**Multicasting**

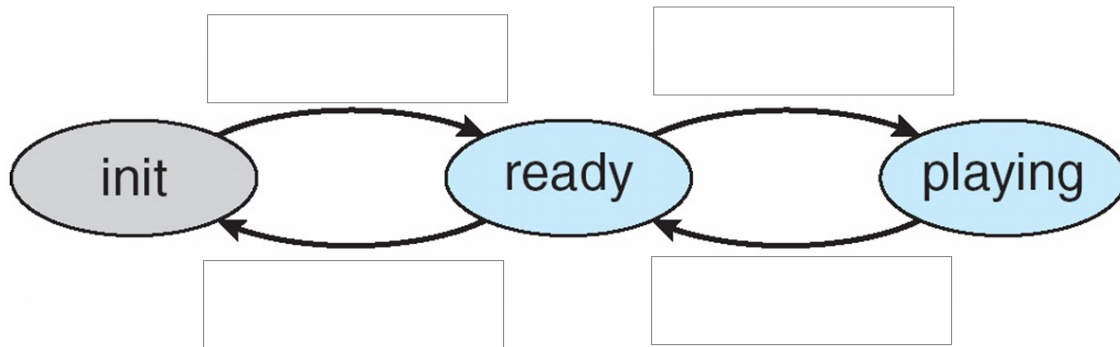
**Question 7: Match between each pair they have a proper relationship. (12 marks, 1 for each)**

<input type="checkbox"/> Caching	1. Is rate at which data flow between drive and computer
<input type="checkbox"/> File Control Block (FCB)	2. Is time to move disk arm to desired cylinder (seek time) and time for desired sector to rotate under the disk head (rotational latency)
<input type="checkbox"/> Rotational latency	3. Results from disk head making contact with the disk surface
<input type="checkbox"/> Positioning time (random-access time)	4. Is the time for the disk are to move the heads to the cylinder containing the desired sector
<input type="checkbox"/> Head crash	5. Is the additional time waiting for the disk to rotate the desired sector to the disk head
<input type="checkbox"/> Continuous-media data	6. Is the total number of bytes transferred, divided by the total time between the first request for service and the completion of the last transfer
<input type="checkbox"/> Virtual memory	7. Fast memory holding copy of data
<input type="checkbox"/> Device reservation	8. Hold output for a device
<input type="checkbox"/> Spooling	9. Provides exclusive access to a device
<input type="checkbox"/> Disk bandwidth	10. Is data with specific rate requirements
<input type="checkbox"/> Seek time	11. Contains many details about the file
<input type="checkbox"/> Transfer rate	12. Separation of user logical memory from physical memory.

**Question 8:** *There are two different types of streaming.*

**List both of them and explain each one** (3 marks, 1½ for each)

**Question 9:** *Real Time Streaming Protocol (RTSP) is a streaming protocol designed for communication between streaming server and media players. It is a stateful connection between the client and the server which allows the client to pause or seek to random positions in the stream during playback. Its delivering of streaming media is similar to delivering using HTTP protocol. The following Figure describes the RTSP state machine. Write down in each box the proper state. (4 marks, 1 for each)*



===== END OF THE QUESTIONS =====

BEST WISHES