

Memory Management

1. (UGCNET-DEC2016-III-2) Which of the following is incorrect for virtual memory?

- (1) Large programs can be written
- (2) More I/O is required
- (3) More addressable memory available
- (4) Faster and easy swapping of process

Answer: 2

2. (UGCNET-AUG2016-III-53) Consider a file currently consisting of 50 blocks. Assume that the file control block and the index block is already in memory. If a block is added at the end (and the block information to be added is stored in memory), then how many disk I/O operations are required for indexed (single-level) allocation strategy?

- (A) 1 (B) 101
- (C) 27 (D) 0

Answer: A

3. (UGCNET-June2016-III-6) In method, the word is written to the block in both the cache and main memory, in parallel.

- (A) Write through (B) Write back
- (C) Write protected (D) Direct mapping

Answer: A

4. (UGCNET-Dec2015-III-4) A dynamic RAM has refresh cycle of 32 times per msec. Each refresh operation requires 100 nsec and a memory cycle requires 250 nsec. What percentage of memory's total operating time is required for refreshes?

- (A) 0.64 (B) 0.96
- (C) 2.00 (D) 0.32

Answer: D

5. (UGCNET-June2015-III-51) What is the most appropriate function of Memory Management Unit (MMU) ?

- (A) It is an associative memory to store TLB
- (B) It is a technique of supporting multiprogramming by creating dynamic partitions
- (C) It is a chip to map virtual address to physical address
- (D) It is an algorithm to allocate and deallocate main memory to a process

Answer: C

- b. Device driver ii. I/O scheduling
- c. Interrupt handler iii. Performs data transfer
- d. Kernel I/O subsystem iv. Processing of I/O request

Codes:

- a b c d
- (1) iii iv i ii
- (2) ii i iv iii
- (3) iv i ii iii
- (4) i iii iv ii

Answer: 1

11. (UGCNET-Dec2015-II-26) A virtual memory has a page size of 1K words. There are eight pages and four blocks. The associative memory page table contains the following entries:

Page	Block
0	3
2	1
5	2
7	0

Which of the following list of virtual addresses (in decimal) will not cause any page fault if referenced by the CPU?

- (A) 1024, 3072, 4096, 6144 (B) 1234, 4012, 5000, 6200
- (C) 1020, 3012, 6120, 8100 (D) 2021, 4050, 5112, 7100

Answer: C

12. (UGCNET-Dec2015-II-27) Suppose that the number of instructions executed between page faults is directly proportional to the number of page frames allocated to a program. If the available memory is doubled, the mean interval between page faults is also doubled. Further, consider that a normal instruction takes one micro second, but if a page fault occurs, it takes 2001 micro seconds. If a program takes 60 sec to run, during which time it gets 15000 page faults, how long would it take to run if twice as much memory were available?

- (A) 60 sec (B) 30 sec
- (C) 45 sec (D) 10 sec

Answer: C

13. (UGCNET-Dec2015-II-28) Consider a disk with 16384 bytes per track having a rotation time of 16 msec and average seek time of 40 msec. What is the time in msec to read a block of 1024 bytes from this disk?

- (A) 57 msec (B) 49 msec
- (C) 48 msec (D) 17 msec

Answer: B

14. (UGCNET-Dec2014-II-37) A specific editor has 200 K of program text, 15 K of initial stack, 50 K of initialized data, and 70 K of bootstrap code. If five editors are started simultaneously, how much physical memory is needed if shared text is used ?

- (A) 1135 K (B) 335 K
(C) 1065 K (D) 320 K

Answer B

15. (UGCNET-Dec2014-II-39) For the implementation of a paging scheme, suppose the average process size be x bytes, the page size be y bytes, and each page entry requires z bytes. The optimum page size that minimizes the total overhead due to the page table and the internal fragmentation loss is given by

- (A) $x/2$
(B) $xz/2$
(C) $\sqrt{2xz}$
(D) $(\sqrt{xz})/2$

Answer: C

16. (UGCNET-Dec2014-II-40) In a demand paging memory system, page table is held in registers. The time taken to service a page fault is 8 m.sec. if an empty frame is available or if the replaced page is not modified, and it takes 20 m.secs., if the replaced page is modified. What is the average access time to service a page fault assuming that the page to be replaced is modified 70% of the time ?

- (A) 11.6 m.sec. (B) 16.4 m.sec.
(C) 28 m.sec. (D) 14 m.sec.

Answer: B

17. (UGCNET-June2014-II-31) In a paged memory management algorithm, the hit ratio is 70%. If it takes 30 nanoseconds to search Translation Look-aside Buffer (TLB) and 100 nanoseconds (ns) to access memory, the effective memory access time is

- (A) 91 ns (B) 69 ns
(C) 200 ns (D) 160 ns

Answer: D

18. (UGC-NET | UGC NET CS 2016 Aug – II | Question 37.) Suppose that the virtual Address space has eight pages and physical memory with four page frames. If LRU page replacement algorithm is used, number of page faults occur with the reference string.

0 2 1 3 5 4 6 3 7 4 7 3 3 5 5 3 1 1 1 7 2 3 4 1

- (A) 11 (B) 12
(C) 10 (D) 9

Answer: A

19. (UGCNET-Dec2013-II-47) The virtual address generated by a CPU is 32 bits. The Translation Look-aside Buffer (TLB) can hold total 64 page table entries and a 4-way set associative (i.e. with 4- cache lines in the set). The page size is 4 KB. The minimum size of TLB tag is

- (A) 12 bits (B) 15 bits

(C) 16 bits (D) 20 bits

Answer: C

20. (UGCNET-Dec2013-II-49) How much space will be required to store the bit map of a 1.3 GB disk with 512 bytes block size ?

- (A) 332.8 KB (B) 83.6 KB
(C) 266.2 KB (D) 256.6 KB

Answer: A

21. (UGCNET-June2013-II-48) Let the page fault service time be 10 millisecond(ms) in a computer with average memory access time being 20 nanosecond(ns). If one page fault is generated for every 10^6 memory accesses, what is the effective access time for memory?

- (A) 21 ns (B) 23 ns
(C) 30 ns (D) 35 ns

Answer: C

19. (UGCNET-Dec2012-II-19) The maturity levels used to measure a process are

- (A) Initial, Repeatable, Defined, Managed, Optimized.
(B) Primary, Secondary, Defined, Managed, Optimized.
(C) Initial, Stating, Defined, Managed, Optimized.
(D) None of the above

Answer: A

22. (UGCNET-Dec2012-II-14) Given a memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K (in order) and processes of 212 K, 417 K, 112 K and 426 K (in order), using the first fit algorithm, in which partition would the process requiring 426 K be placed?

- A. 500 K
B. 200 K
C. 300 K
D. 600 K

Marks given to all

23. Page making process from main memory to disk is called

- (A) Interruption
(B) Termination
(C) Swapping
(D) None of the above

Answer: C

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24. (UGCNET-dec2009-ii-37) A page fault

- (A) is an error specific page.
(B) is an access to the page not currently in memory.
(C) occur when a page program occur in a page memory.
(D) page used in the previous page reference.

Answer: B

25. (UGCNET-dec2009-ii-38) A semaphore count of negative n means ($s=-n$) that the queue contains waiting processes.

- (A) $n + 1$
- (B) n
- (C) $n - 1$
- (D) 0

Answer: B

26. (UGCNET-dec2009-ii-39) A program is located in the smallest available hole in the memory is

- (A) best – fit
- (B) first – bit
- (C) worst – fit
- (D) buddy

Answer: A

27. (UGCNET-june2009-ii-34) With a four programs in memory and with 80% average I/O wait, the CPU utilization is?

- (A) 60%
- (B) 70%
- (C) 90%
- (D) 100%

Answer: A

28. (UGCNET-june2009-ii-10) Assume N segments in memory and a page size of P bytes. The wastage on account of internal fragmentation is:

- (A) $NP/2$ bytes
- (B) $P/2$ bytes
- (C) $N/2$ bytes
- (D) NP bytes

Answer: A

29. Suppose it takes 100 ns to access page table and 20 ns to access associative memory. If the average access time is 28 ns, the corresponding hit rate is:

- (A) 100 percent
- (B) 90 percent
- (C) 80 percent
- (D) 70 percent

Answer: B

[ugc net 2009 june paper-2](#)

30. (UGCNET-June2012-II-32) Cached and interleaved memories are ways of speeding up memory access between CPU's and slower RAM. Which memory models are best suited (i.e. improves the performance most) for which programs ?

- (i) Cached memory is best suited for small loops.
- (ii) Interleaved memory is best suited for small loops
- (iii) Interleaved memory is best suited for large sequential code.

(iv) Cached memory is best suited for large sequential code.

(A) (i) and (ii) are true.

(B) (i) and (iii) are true.

(C) (iv) and (ii) are true.

(D) (iv) and (iii) are true.

Answer: B

31. Consider a logical address space of 8 pages of 1024 words mapped with memory of 32 frames. How many bits are there in the physical address?

(A) 9 bits

(B) 11 bits

(C) 13 bits

(D) 15 bits

Answer: D

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32. (UGCNET-dec2008-ii-42) If the executing program size is greater than the existing RAM of a computer, it is still possible to execute the program if the OS supports:

(A) multitasking

(B) virtual memory

(C) paging system

(D) none of the above

Answer: B

33. (UGC NET Computer Science Solved Paper II - June 2008) With 64 bit virtual addresses, a 4KB page and 256 MB of RAM, an inverted page table requires:

(A) 8192 entries.

(B) 16384 entries.

(C) 32768 entries.

(D) 65536 entries.

Answer: D

34. A program has five virtual pages, numbered from 0 to 4. If the pages are referenced in the order 012301401234, with three page frames, the total number of page faults with FIFO will be equal to:

(A) 0 (B) 4

(C) 6 (D) 9

Answer: D

UGCNET-June2016-II-36

35. Average process size = s bytes. Each page entry requires e bytes. The optimum page size is given by:

(A) \sqrt{se} (B) $\sqrt{2se}$

(C) s (D) e

Answer: B

UGCNET-Dec2014-II-39

36. Cache memory is:

- (A) High Speed Register
- (B) Low-Speed RAM
- (C) Non-Volatile RAM
- (D) High-Speed RAM

Answer: D

37. (Paper II June 2006 No: 38) A page fault

- (A) is an error in specific page
- (B) is an access to the page not currently in main memory
- (C) occurs when a page program accesses a page of memory
- (D) is reference to the page which belongs to another program

Answer: B

38. (UGCNET-DEC2016-III-50) Consider a disk queue with I/O requests on the following cylinders in their arriving order:

6,10,12,54,97,73,128,15,44,110,34,45

The disk head is assumed to be at cylinder 23 and moving in the direction of decreasing number of cylinders. Total number of cylinders in the disk is 150. The disk head movement using SCAN-scheduling algorithm is:

- (1) 172
- (2) 173
- (3) 227
- (4) 228

Answer: 2

39. (UGCNET-June2016-II-38) If the Disk head is located initially at track 32, find the number of disk moves required with FCFS scheduling criteria if the disk queue of I/O blocks requests are 98, 37, 14, 124, 65, 67

- A. 320
- B. 322
- C. 321
- D. 319

Answer C

40. (UGCNET-June2014-II-34) Match the following:

List – I List – II

- a. Contiguous allocation i. This scheme supports very large file sizes
- b. Linked allocation ii. This allocation technique supports only sequential files
- c. Indexed allocation iii. Number of disks required to access file is minimal
- d. Multi-level indexed iv. This technique suffers from maximum wastage of space in storing pointers

- A. a-iii; b-iv; c-ii; d-i
- B. a-iii; b-ii; c-iv; d-i
- C. a-i; b-ii; c-iv; d-iii
- D. a-i; b-iv; c-ii; d-iii

Answer: B

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47. (DECEMBER 2011 - PAPER II 28) On receiving an interrupt from an I/O device, the CPU
- (A) halts for predetermined time.
 - (B) branches off to the interrupt service routine after completion of the current instruction
 - (C) branches off to the interrupt service routine immediately.
 - (D) hands over control of address bus and data bus to the interrupting device.

Answer: B

48. (UGCNET-Dec2011-II-29) The maximum amount of information that is available in one portion of the disk access arm for a removal disk pack (without further movement of the arm with multiple heads)
- (A) a plate of data
 - (B) a cylinder of data
 - (C) a track of data
 - (D) a block of data

Answer: B

49. Which page replacement policy suffers from Belady's anomaly?
- (A) LRU
 - (B) LFU
 - (C) FIFO
 - (D) OPTIMAL

Answer: C

GATE2009-9, ISRO2016-52

50. (UGCNET-Nov2017-II-37) In disk scheduling algorithm, the disk head moves from one end to other end of the disk, serving the requests along the way. When the head reaches the other end, it immediately returns to the beginning of the disk without serving any requests on the return trip.
- (1) LOOK
 - (2) SCAN
 - (3) C - LOOK
 - (4) C - SCAN

Answer: 4

51. (UGCNET-Nov2017-II-38) Suppose there are six files F1, F2, F3, F4, F5, F6 with corresponding sizes 150 KB, 225KB, 75 KB, 60 KB, 275 KB and 65 KB respectively. The files are to be stored on a sequential device in such a way that optimizes access time. In what order should the files be stored?
- (1) F5, F2, F1, F3, F6, F4
 - (2) F4, F6, F3, F1, F2, F5
 - (3) F1, F2, F3, F4, F5, F6
 - (4) F6, F5, F4, F3, F2, F1

Answer: 2

52. (UGCNET-June2015-II-36) A disk drive has 100 cylinders, numbered 0 to 99. Disk requests come to the disk driver for cylinders 12, 26, 24, 4, 42, 8 and 50 in that order. The driver is

currently serving a request at cylinder 24. A seek takes 6 msec per cylinder moved. How much seek time is needed for shortest seek time first (SSTF) algorithm?

- (A) 0.984 sec (B) 0.396 sec
(C) 0.738 sec (D) 0.42 sec

Answer: D

53. (UGCNET-June2015-II-38) A LRU page replacement is used with four page frames and eight pages. How many page faults will occur with the reference string 0172327103 if the four frames are initially empty?

- (A) 6 (B) 7
(C) 5 (D) 8

Answer: B

54. (UGCNET-June2013-III-59) A job has four pages A, B, C, D and the main memory has two page frames only. The job needs to process its pages in following order:

ABACABDBACD

Assuming that a page interrupt occurs when a new page is brought in the main memory, irrespective of whether the page is swapped out or not. The number of page interrupts in FIFO and LRU page replacement algorithms are

- (A) 9 and 7
(B) 7 and 6
(C) 9 and 8
(D) 8 and 6

Answer: C

55. (UGCNET-June2013-III-63) Working set model is used in memory management to implement the concept of

- (A) Swapping
(B) Principal of Locality
(C) Segmentation
(D) Thrashing

Answer: B

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Answer: B

58. (UGCNET-June2013-III-10) Match the following:

List - I

- a. RAID 0
- b. RAID 1
- c. RAID 2
- d. RAID 3

List - II

- i. Bit interleaved parity
- ii. Non redundant stripping
- iii. Mirrored disks
- iv. Error correcting codes

Codes:

- a b c d
- (A) iv i ii iii
- (B) iii iv i ii
- (C) iii i iv ii
- (D) iii ii iv i

Answer: Marks given to all

59. (UGC NET Paper II June 2005 No:36) Moving process from main memory to disk is called:

- (A) Caching
- (B) Termination
- (C) Swapping
- (D) Interruption

Answer: C

60. (UGC net paper-2-dec-2005 No: 31) The Register or main memory location which contains the effective address of the operand is known as:

- (A) Pointer
- (B) Indexed register

(C) Special Locations (D) Scratch pad

Answer: A

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- (A) Pointer (B) Indexed register
- (C) Special Locations (D) Scratch pad

Answer: A

63. (UGCNET-Dec2014-III-49) Various storage devices used by an operating system can be arranged as follows in increasing order of accessing speed :

- (A) Magnetic tapes magnetic disks optical disks electronic disks main memory cache registers
- (B) Magnetic tapes magnetic disks electronic disks optical disks main memory cache registers
- (C) Magnetic tapes electronic disks magnetic disks optical disks main memory cache registers
- (D) Magnetic tapes optical disks magnetic disks electronic disks main memory cache registers

Answer: D

64. (UGCNET-Dec2014-III-50) How many disk blocks are required to keep list of free disk blocks in a 16 GB hard disk with 1 kB block size using linked list of free disk blocks ? Assume that the disk block number is stored in 32 bits.

- (A) 1024 blocks (B) 16794 blocks
- (C) 20000 blocks (D) 1048576 blocks

Answer: Marks given to all

65. (UGCNET-Dec2014-III-51) Consider an imaginary disk with 40 cylinders. A request come to read a block on cylinder 11. While the seek to cylinder 11 is in progress, new requests come in for cylinders 1, 36, 16, 34, 9 and 12 in that order. The number of arm motions using shortest seek first algorithm is

- (A) 111 (B) 112
- (C) 60 (D) 61

Answer: D

66. (UGCNET-June2014-III-35) Consider a program that consists of 8 pages (from 0 to 7) and we have 4 page frames in the physical memory for the pages. The page reference string is :

1 2 3 2 5 6 3 4 6 3 7 3 1 5 3 6 3 4 2 4 3 4 5 1

The number of page faults in LRU and optimal page replacement algorithms are respectively (without including initial page faults to fill available page frames with pages):

- (A) 9 and 6
- (B) 10 and 7
- (C) 9 and 7
- (D) 10 and 6

Answer: B

67. (UGC NET Paper -II June2011 No: 30) Virtual memory is

- (A) related to virtual reality
- (B) a form of ROM
- (C) a form of RAM
- (D) None of the above

Answer: C

68. (UGCNET-June2012-III-45) A computer system supports 32 bit virtual address as well as 32 bit physical addresses. Since the virtual address space is of same size as that of physical address space, if we want to get rid of virtual memory, which one of the following is true?

- (A) Efficient implementation of multiuser support is no longer possible.
- (B) The processor cache can be made more efficient.
- (C) Hardware support for memory management is not needed.
- (D) CPU scheduling can be made more efficient.

Answer: C

69. (UGCNET-June2012-III-48) If an instruction takes 'i' microseconds and a page fault takes an additional 'j' microseconds. The effective instruction time, if on the average a page fault occurs every k instructions, is

- (A) $i + j/k$
- (B) $i + j * k$
- (C) $(i + j)/k$
- (D) $(i + j) * k$

Answer: A

70. (UGCNET-Dec2015-III-38) Function of memory management unit is :

- (A) Address translation
- (B) Memory allocation
- (C) Cache management
- (D) All of the above

Answer: A

