



Examination : Third Sessional

Seat No. :

Date : 28-03-2018

Day : Wednesday

Time : 12:00 to 01:15

Max. Marks : 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

- (a) How inverted page table mechanism is different compare to traditional paging? Explain [2]
pros and cons of inverted paging.
- (b) Consider a paging hardware with a TLB. Assume that the entire page table and all the [2]
pages are in the physical memory. It takes 10 milliseconds to search the TLB and 80
milliseconds to access the physical memory. If the TLB hit ratio is 0.6, the effective
memory access time (in milliseconds) is _____. [Justification Required]
- (c) Explain memory allocation with best fit, worst fit and first fit approach [2]
- (d) Which property is required by any page replacement algorithm if it doesn't suffer with [2]
Belady's Anomaly?
- (e) Discuss difference between Local frame allocation algorithm and Global frame allocation [2]
algorithm.
- (f) Assume that you have a page-reference string for a process with X frames (initially all [2]
empty). The page-reference string has length A and B distinct page numbers occur in it.
Answer these questions for any page- replacement algorithms:
a. What is a lower bound on the number of page faults?
b. What is an upper bound on the number of page faults?

Q.2 Attempt *Any TWO* of the following questions.

[12]

- (a) Discuss various file allocation methods along with their advantages and disadvantages. [6]
- (b) A computer has twenty physical page frames which contain pages numbered 101 through [6]
120. Now a program accesses the pages numbered 1, 2, ..., 100 in that order, and repeats the
access sequence THRICE. How many page faults will occur in optimal page replacement
policy? Which one of the following page replacement policies experiences the same number of
page faults as the optimal page replacement policy for this program? Find total number of page
faults in each of the following algorithm. (a) Last in First Out (b) Most recently Used
- (c) Consider a demand paging system with a paging disk that has an average access and transfer [6]
time of 40 mille seconds. Addresses are translated through a page table in main memory with
and access time of 1 micro seconds per memory access. Thus each memory reference through
the page table takes two memory accesses. To improve this time we have added an associative
memory that reduces access time to one memory reference. If the page table entry is in the
associative memory. Assume that 80% of accesses are in the associative memory and that of
from remaining 10% (2% of total) causes page faults. What is the effective memory access
time?

Q.3 (a) Explain memory management using paging technique. Give suitable example. [6]

- (b) A computer has a 32 bit virtual address space and 1024 Bytes pages. A page table entry [6]
is 4 bytes. A multilevel page table is used because each page must fit in a page. How
many levels are required? Also tell how many bits are required to index page table at
each level? [Detail Explanation Require.]

OR

**Q.3 (a) Which are the advantages of segmentation over paging? Explain with example. How to [6]
implement segmentation in memory management? Give proper example.**

- (b) What is address binding? List and explain different types of address binding with appropriate [6]
examples. Explain Multistep processing of a user program with necessary steps.