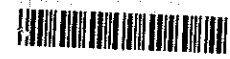


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Question Paper Code : 40905

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Fourth/Fifth/Sixth Semester
Computer Science and Engineering
CS 6401 – OPERATING SYSTEMS
(Common to : Electronics and Communication Engineering/Electronics and
Instrumentation Engineering/Instrumentation and Control Engineering/Medical
Electronics/Information Technology)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is the difference between trap and interrupt ?
2. Mention the purpose of system calls.
3. What are the benefits of synchronous and asynchronous communication ?
4. Give an programming example in which multithreading does not provide better performance than a single-threaded solutions.
5. Define external fragmentation.
6. What are the counting based page replacement algorithm ?
7. State the typical bad-sector transactions.
8. What is the advantage of bit vector approach in free space management ?
9. List the advantages and disadvantage of writing an operating system in high-level language such as C.
10. What is handle ? How does a process obtain a handle ?

PART - B

(5×13=65 Marks)

11. a) State the operating system structure. Describe the operating-system operations in detail. Justify the reason why the lack of a hardware-supported dual mode can cause serious shortcoming in an operating system ?

(OR)

- b) i) Give reason why caches are useful. What problems do they solve ? What problems do they cause ? If a cache can be made as large as the device for which it is caching why not make it that large and eliminate the device ? (8)
ii) Describe the major activities of operating system with regards to file management. (5)

12. a) Describe the difference among short-term, medium-term and long-term scheduling with suitable example.

(OR)

- b) Explain the differences in the degree to which the following scheduling algorithms discriminate in favor of short processes :
i) RR
ii) Multilevel feedback queues.

13. a) Explain why sharing a reentrant module is easier when segmentation is used than when pure paging is used with example.

(OR)

- b) Discuss situation under which the most frequently used page replacement algorithm generates fewer page faults than the least recently used page-replacement algorithm. Also discuss under which circumstances the opposite holds.

14. a) What are the various disk space allocation methods. Explain any two in detail.

(OR)

- b) State and explain the FCFS, SSTF and SCAN disk scheduling with examples.

15. a) i) Under what circumstance would a user process request an operation that results in the allocation of a demand-zero memory region. (8)
ii) Describe an useful application of the no-access page facility provided in Window XP. (5)

(OR)

- b) i) What optimization were used to minimize the discrepancy between CPU and I/O speeds on early computer systems. (8)
ii) What manages cache in Windows XP ? How is cache managed ? (5)

PART - C

(1×15=15 Marks)

16. a) Consider a system consisting of 'm' resources of the same type being shared by 'n' processes. Resource can be requested and released by processes only one at a time. Show that the system is deadlock free if the following two conditions hold :
i) The maximum need of each process is between 1 and m resources.
ii) The sum of all maximum needs is less than $m + n$.

(OR)

- b) Consider the following set of processes, with the length of the CPU burst given in milliseconds :

Process	Burst Time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The process are assumed to have arrived in the order P₁, P₂, P₃, P₄, P₅ all at time 0.

- i) Draw Gantt charts that illustrate the execution of these processes using the scheduling algorithms FCFS (smaller priority number implies higher priority) and RR (quantum = 1). (10)
ii) What is the waiting time of each process for each of the scheduling algorithms ? (5)