Question Paper Code : X 60397

B.E./B.Tech. DEGREE EXAMINATIONS, NOV./DEC. 2020

Seventh Semester

Electrical and Electronics Engineering

CS 2411/CS 609 – OPERATING SYSTEMS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulations 2008)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. What are the three main purposes of an operating system ?

2. What are the situations in which change of state of one process may cause a change in the state of another process ?

3. How can starvation/indefinite blocking of processes be avoided in priority scheduling ?

4. What is a semaphore ?

5. What is the difference between simple paging and virtual memory paging ?

6. What is principle of locality ?

7. What is a file management system ?

8. What are the disadvantages of log-structured file systems ?

9. What is an interrupt ? When the CPU gets notified on an incoming interrupt ?

10. List the outcomes produced on a Disk write.

PART – B (5×16=80 Marks)

11. a) i) What are system calls ? Discuss briefly the types of system calls provided by the operating systems. **(10)**

　　ii) Explain briefly Process concepts. **(6)**

(OR)

　b) i) Discuss briefly about Inter process communication in threading. **(8)**

　　ii) Explain in detail about the issues in threading. **(8)**

12. a) i) What are race conditions and what is the importance of mutual exclusion ? Write a note on the difference between semaphores and monitors. **(8)**

　　ii) Explain Readers and Writers problem and present its solution using semaphores. **(8)**

(OR)

　b) i) Define Deadlock and list out its characteristics. **(8)**

　　ii) Discuss banker's algorithm in handling deadlock with suitable example. **(8)**

13. a) Describe the following allocation algorithms : Best-fit, first-fit and worst-fit. Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB, how would each of the above algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB ? Which algorithm makes efficient use of memory ?

(OR)

　b) The page table for the process currently executing on the processor looks like the following. The page size is 1024 bytes

Virtual page #	Valid bit	Reference bit	Modify bit	Page frame #	Time loaded	Time referenced
0	1	1	0	4	60	161
1	1	1	1	7	130	160
2	0	0	0	–	26	162
3	1	0	0	2	20	163
4	0	0	0	–	30	170
5	1	0	1	0	35	100

　　i) Describe exactly how, in general a virtual address generated by the CPU is translated into physical address.

　　ii) What physical address, if any, would each of the following virtual addresses correspond to ?
　　　1) 1052　　2) 2221　　3) 5499

　　iii) Which page will be selected if there is a page fault for virtual page 4 has occurred, using (1) FIFO (2) LRU (3) CLOCK ?

14. a) Explain various file allocation techniques in detail with their relative advantages and disadvantages. **(16)**

(OR)

b) i) Describe the most common schemes for defining the logical structure of a directory. **(10)**

ii) Explain how does NTFS recover from a system crash. **(6)**

15. a) i) Explain Direct Memory Access in detail. **(8)**

ii) Discuss the principles to be incorporated to improve the efficiency of I/O. **(8)**

(OR)

b) i) How Swap space is used ? Where the Swap space is located in the disk ? How Swap space is managed ? **(8)**

ii) Write short notes on Tertiary storage devices. **(8)**

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