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Question Paper Code : 60400

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electrical and Electronics Engineering

CS 2411/CS 609/10144 CS 405 — OPERATING SYSTEMS

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

(Also common to 10144 CS 405 – Operating Systems for B.E. (Part-Time) Fourth Semester CSE - Regulations 2010)

(Regulations 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is medium term scheduling?

2. Why a thread is called as light weight process?

3. "Apparent concurrency increases the scheduling overhead without providing any speed up of an application program". Comment on this statement.

4. A system has two processes and three identical resources. Each process needs a maximum of two resources. Is deadlock possible? Justify the answer.

5. Differentiate between page and segment.

6. Differentiate between internal and external fragmentation.

7. Name any four common file types.

8. What is NFS?

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) Briefly explain the various managements of the operating systems and their responsibilities in detail. (10)

(ii) What is context switching? Explain with necessary diagram. (6)

Or

(b) (i) Discuss about the issues to be considered with multithreaded programs. (8)

(ii) What is a remote procedure call? Describe the steps involved in executing a remote procedure call. (8)

12. (a) Consider the following set of processes, with the length of the CPU burst time given in milliseconds All five processes arrive at time 0, in the order given.

Process	Burst time
P1	10
P2	29
P3	03
P4	07
P5	12

(i) Draw the Gantt chart illustrating the execution of these processes using FCFS, SJF and RR (quantum = 10 milliseconds) scheduling. (8)

(ii) Calculate the average turn around time and average waiting time for each type of scheduling mentioned above. (8)

Or

(b) (i) Define the critical section problem and discuss the three requirements that a solution to the critical section problem must satisfy. (8)

(ii) Consider the following snapshot of a system : (8)

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm :

(1) What is the content of the matrix Need? Is the system in a safe state?

(2) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?

13. (a) With a neat sketch, explain about Segmentation and Paging. (16)

Or

(b) Discuss about any three page replacement algorithm in detail. (16)

14. (a) Explain the various file allocation methods and calculate the number of I/O operations required for each of the file allocation method to perform the following operations :

(i) the block is added at the beginning

(ii) the block is added in the middle

(iii) the block is removed from the end.

Or

(b) Describe the free-space management followed in file system. And consider the beginning of a free space bitmap looks like this after the disk partition is first formatted 1000 0000 0000 0000 (the first block is used by the root directory). The system always searches for free blocks starting at the lowest numbered blocks, show the bitmap after each of the following actions

(i) File A is written using 6 blocks

(ii) File B is written using 5 blocks

(iii) File A is deleted

(iv) File C is written using 8 blocks

(v) File B is deleted.

15. (a) (i) Explain the 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)
