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B. Tech. (CSE)

End-Semester Examination

Roll No.

Fourth Semester

(May 2018)

CO-204 OPERATING SYSTEMS

Time: 3 hrs

Max. Marks: 40

Note: Question No. 1 is compulsory. Answer any 3 questions from the remaining. Assume suitable missing data if any.

Q1. Answer the following:

(2*5=10)

- a) What is the purpose of system programs?
- b) Explain the significance of calculating the Matrix 'Need' to determine safe/unsafe state with the help of an example
- c) What is Thrashing? How does the system detect Thrashing?
- d) Why are page sizes always power of 2?
- e) What is meant by seek time and rotational latency in case of disk drive?

Q2. a) Differentiate between symmetric and asymmetric multiprocessing. What are the advantages and disadvantages of multiprocessing systems? How is scheduling done in multiprocessor systems?

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- b) 5 jobs A through E arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4 and 8 minutes. Their priorities are 3, 5, 2, 1 and 4 respectively, with 5 being the highest priority. For each of the following scheduling algorithms, determine the mean process turnaround time:

4

P.T.O

- i) Round robin (Quantum= 4 sec)
- ii) Priority Scheduling
- iii) FCFS (run in order 10, 6, 2, 4, 8)
- iv) Shortest Job First

Q3. a) Explain the Resource-Allocation-Graph algorithm for deadlock avoidance. 4

b) Describe the terms race condition & critical section. Provide a solution for Readers/Writers problem using semaphores with no busy waiting 6

OR

What is a Process? Explain the various fields of Process Control Block. What causes a process/thread to change the state?

- i) From running to ready?
- ii) From ready to running?
- iii) From running to blocked?
- iv) From blocked to ready?

Q4. a) Given memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212K, 417K, 112K, and 426K (in order)? Which algorithm makes the most efficient use of memory? 3

b) Differentiate between Internal and External Fragmentation. 2

c) Consider the following segment table: 5

P.T.O

Segment	Base	Length
0	219	600
1	230	014
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?
Explain in detail.

- i) 0, 430 ii) 1, 10 iii) 2, 500 iv) 3, 400 v) 4, 112

Q5. a) Enlist different file operations.

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b) Explain in detail about Device Management policies

4

c) Briefly discuss about the various directory structures

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OR

Compare the functionalities of FCFS, CSCAN, SSTF and C-LOOK disk scheduling algorithms with an example for each.

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