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Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Operating Systems

Time: 3 hrs.   Max. Marks:100

*Note: **Answer FIVE full questions, selecting**
at least TWO questions from each part.*

PART – A

1   a. Distinguish between the following pairs of terms :
i)   Symmetric and asymmetric multiprocessor systems
ii) Cpu burst and I/O burst jobs
iii) User's view and systems view of OS
iv) Batch systems and time sharing systems
v)   User mode and kernel mode operations.   **(10 Marks)**
b. List the three main advantages of multiprocessor systems. Also bring out the difference between graceful degradation and fault tolerance in this context.   **(05 Marks)**
c. What are virtual machines? How are they implemented?   **(05 Marks)**

2   a. What is a process? What are the states a process can be in? Give the process state diagram clearly indicating the conditions for a process to shift from one state to another.   **(08 Marks)**
b. What are the merits of inter process communication? Name the two major models of inter process communication.   **(06 Marks)**
c. What is a thread? What is need for multithreaded processes? Indicate the four major categories of benefits derived from multi threaded programming.   **(06 Marks)**

3   a. What is a critical section problem? What requirements should a solution to critical section problem satisfy? State Peterson's solution and indicate how it satisfies the above requirements.   **(10 Marks)**
b. Explain the operation of semaphores. Bring out how their operation may lead to priority inversion.   **(10 Marks)**

4   a. Define deadlock. What are the necessary conditions for deadlock to occur? Indicate how many of these should occur for dead lock to happen?   **(10 Marks)**
b. State and explain banker's algorithm for deadlock avoidance.   **(10 Marks)**

PART – B

5   a. What is the principle behind paging? Explain its operation, clearly indicating how the logical addresses are converted to physical addresses.   **(10 Marks)**
b. A hypothetical main memory can store only 3 frames simultaneously. The sequence in which the pages will be required is given below:
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 (Twenty operations).
Indicate the sequence in which the three frames will be filled in i) FIFO   ii) Optimal Page Replacement and iii) Least Recently used methods of page replacement. Indicate number of page faults in each case.   **(10 Marks)**

6   a. List any five typical file attributes and any five file operations indicating their purpose in one line each.   **(10 Marks)**
b. Briefly explain the methods of keeping track of free space on disks.   **(10 Marks)**

7   a. What is disk scheduling? Discuss different disk scheduling techniques.   **(12 Marks)**
b. Explain the capability lists methods of implementing access matrix.   **(08 Marks)**

8   a. How does Linux achieve interprocess communication?   **(10 Marks)**
b. How does Linux manage authentication and access control mechanisms?   **(10 Marks)**

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