

Code No: 55031

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech III Year I Semester Examinations, May/June - 2015

OPERATING SYSTEMS

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) List out what resources must be managed carefully in the following settings:  
i) Mainframe or minicomputer systems  
ii) Workstations connected to servers  
iii) Handheld computers
- b) Identify three advantages and one disadvantage of multiprocessor systems. [9+6]
- 2.a) Demonstrate the differences among short-term, medium-term, and long-term scheduling.
- b) Examine the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst	Time Priority
P <sub>1</sub>	8	2
P <sub>2</sub>	1	1
P <sub>3</sub>	3	3
P <sub>4</sub>	1	4
P <sub>5</sub>	5	2

The processes are assumed to have arrived in the order P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, P<sub>5</sub>, all at time 0.

- i) Draw Gantt charts that illustrate the execution of these processes using RR scheduling.
- ii) What is the turnaround time of each process?
- iii) What is the average waiting time? [5+10]
- 3.a) Distinguish Why do Solaris, Linux, and Windows XP use spinlocks as a synchronization mechanism only on multiprocessor systems and not on single-processor systems?
- b) Define monitor? Describe how it is used in solving critical section problem. [8+7]
- 4.a) Describe about hierarchical paging.
- b) Illustrate a logical address space of 64 pages of 1,024 words each, mapped onto a physical memory of 32 frames.
- i) How many bits are there in the logical address?
- ii) How many bits are there in the physical address? [7+8]
- 5.a) Briefly explain about deadlock prevention methods with examples of each.
- b) Consider a system with three resource types and the vector *Available* initialized to (4,2,2). If process P<sub>0</sub> asks for (2,2,1), it gets them. If P<sub>1</sub> asks for (1,0,1), it gets them. Then, if P<sub>0</sub> asks for (0,0,1), it is blocked (resource not available). If P<sub>2</sub> now asks for (2,0,0), it gets the available one (1,0,0) and one that was allocated to P<sub>0</sub> (since P<sub>0</sub> is blocked). P<sub>0</sub>'s *Allocation* vector goes down to (1,2,1), and its *Need* vector goes up to (1,0,1). Can deadlock occur? If you answer "yes," give an example. If you answer "no," specify which necessary condition cannot occur. [7+8]

- 6.a) Distinguish file management systems in UNIX, Linux, Windows operating systems.  
b) Discuss about the access rights and management of simultaneous access. [7+8]
- 7.a) Compare and contrast RAID levels 0, 1, 2, 3, 4, 5.  
b) Assume the head of a moving-head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following disk scheduling algorithms.  
i) FCFS  
ii) Random. [5+10]
- 8.a) Describe I/O protection, CPU protection, memory protection with a neat diagram.  
b) Write a brief note on intrusion detection. [7+8]

