First Semester M.Tech. Degree Examination, June/July 2015
Advances in Operating Systems

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a.   Describe the essential properties of the following types of the operating systems :
         i) Time sharing   ii) Embedded system.   **(06 Marks)**
      b.   Discuss with an example, the concept of multiprogramming and multiprocessing using systems. Also discuss in detail the advantages of multiprocessing systems.   **(08 Marks)**
      c.   Explain in detail, the UNIX system architecture with a neat diagram.   **(06 Marks)**

2   a.   Define and list out in detail, the differences between a thread and a process. Explain with an example the concept of sequential and multithreaded computation along with their advantages and disadvantages.   **(10 Marks)**
      b.   With a neat diagram, briefly explain the Linux operating system kernel components.
                                                           (06 Marks)
      c.   Discuss the POSIX file operation system calls.   **(04 Marks)**

3   a.   Explain any five major activity of an operating system in regard to main memory management.   **(05 Marks)**
      b.   List and briefly define four classes of real time scheduling algorithm.   **(04 Marks)**
      c.   Discuss in detail, how paged virtual memory is implemented in UNIX and Solaris. **(08 Marks)**
      d.   List three advantages of user level threads over kernel level threads.   **(03 Marks)**

4   a.   Explain the distributed algorithm for mutual exclusion with an example.   **(08 Marks)**
      b.   Discuss the advantages of the use of micro kernel.   **(06 Marks)**
      c.   Discuss in detail the different states in windows thread using a state transition diagram.
                                                           (06 Marks)

5   a.   Discuss in detail, how processes are managed in UNIX SVR4.   **(08 Marks)**
      b.   List and briefly define five general areas of requirements for a real time operating system.   **(06 Marks)**
      c.   Explain the following system calls :   i) fork( )   ii) join( )   iii) quit( ).   **(06 Marks)**

6   a.   List and explain some of the potential advantages of process migration.   **(04 Marks)**
      b.   Discuss the three characteristics of a bot.   **(06 Marks)**
      c.   List and briefly define three intruder behaviour patterns.   **(06 Marks)**
      d.   What are the different methods of handling deadlocks?   **(04 Marks)**

7   a.   Explain with a figure how traps, interrupts and exceptions are handled by the windows NT/2000 organization.   **(06 Marks)**
      b.   With a neat diagram, explain the process and resources management organization in LINUX.   **(08 Marks)**
      c.   Explain the four mechanisms used by the Linux Kernel to perform the inter-process communication.   **(06 Marks)**

8   a.   With a neat diagram, explain the components of Tiny OS.   **(08 Marks)**
      b.   List and briefly define five different categories of synchronization granularity.   **(06 Marks)**
      c.   Discuss in detail the classification of viruses.   **(06 Marks)**

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