Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

IT–504

B. E. (Fifth Semester) EXAMINATION, Dec., 2011

(Information Technology Engg. Branch)

SYSTEM PROGRAMMING AND OPERATING SYSTEM

(IT – 504)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *five* questions in all taking *one* from each Unit. . All questions carry equal marks.

Unit – I

1. (a) Explain the following terms : 12

   (i) Dynamic linking and loading

   (ii) Application software and system software

   (iii) Linkage editors

   (b) What are the two models of interprocess communication ? What are the strengths and weaknesses of two approaches. 8

Or

2. (a) List five services provided by an operating system that are designed to make it more convenient for users to use the computer system. In what cases it would be impossible for user level program to provide these services ? Explain. 10

P. T. O.

(b) What are *five* major activities of an operating system with regard to file management ? 10

Unit – II

3. (a) What are semaphores ? Explain producer consumer problem. 10

(b) Discuss how the following pairs of scheduling criteria conflict in certain settings : 10

(i) CPU utilization and response time

(ii) Average turnaround time and maximum waiting time

Or

4. (a) Write and explain the Reader's and Writer's problem. Also provide the solution for the problem using semaphores. 10

(b) Provide two programming examples of multithreading that do not improve performance over a single threaded solution. 10

Unit – III

5. (a) Compare the main memory organization schemes of continguous memory allocation, pure segmentation and pure paging with respect to the following issue : 12

(i) External fragmentation

(ii) Internal fragmentation

(iii) Ability to share code across process

(b) What is the cause of thrashing ? Explain the methods by which thrashing could be controlled. 8

Or

6. (a) List and explain the four necessary conditions that must hold simultaneously for a deadlock to occur. 10

(b) Describe Banker's algorithm with an example. 10

Unit – IV

7. (a) Discuss the hardware support required to support demand paging. 8

   (b) Explain the LRU and optimal page replacement algorithms. 12

Or

8. (a) What is page fault ? List all steps of how a page fault is serviced by the operating system. 10

   (b) Explain different protection mechanisms in operating system. 10

Unit – V

9. (a) Explain briefly automatic allocation and dynamic allocation techniques in connetion with file system. 8

   (b) Discuss on the following disk scheduling algorithms : 12

   (i) SCAN

   (ii) C-LOOK

   (iii) First come first served

Or

10. (a) Explain briefly how process management is done in Linux. 10

    (b) Describe different schemes for defining the logical structure of a directory. 10

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