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B. E. 5th Semester (I.T.)

Examination – December, 2011

PRINCIPLES OF OPERATING SYSTEM

Paper : CSE-301-E

Time : Three hours]   *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions.

1. (a) What are the basic functions of an operating system ?

   (b) List four modules of an operating system and explain in detail of functionality of each module.

   (c) Differentiate between hard and soft real time operating system.

   (d) What are system calls ? Discuss.

2. (a) Consider the following set of processes in order P1, P2 P3, P4 and P5 with the length of the CPU burst time given in milliseconds. Their priorities are 3, 5, 2, 1 and 4 respectively, with 5 being the highest priority. Calculate average waiting time

and turnaround time using following scheduling algorithms:

(i) Shortest Remaining Time First,

(ii) Round Robin (q =2),

(iii) Shortest Job First,

(iv) Priority scheduling (preemptive)

Process	Arrival time	Burst
P1	0	10
P2	1	9
P3	2	6
P4	3	7
P5	4	1

(b) Differentiate between process and program.

3. (a) What is a page fault ? What are the steps to be following by operating system after page fault has occurred ?

(b) In the context of paging system, discuss the following :

(i) Thrashing and causes of thrashing,

(ii) Global vs Local Allocation of page frames,

(iii) Working set model.

4. (a) Explain contigous allocation and linked list allocation for implementing file storage.

(b) What are the advantages of a Distributed File System over a file system in a centralized system ?

5. (a) What is a semaphore ? Which are operations done on semaphore ? Give implementation of producer-consumer problem with bounded buffer using semaphore.

(b) What are the algorithms for deadlock prevention ?

6. (a) What are the various layers of I/O software ? Explain the function of each layer.

(b) Describe the concept of demand segmentation.

7. (a) Explain the architecture of UNIX operating system.

(b) Explain the protection domain in UNIX.

8. Write short notes on the following :

(a) Windows NT,

(b) Structure of PCB,

(c) Internal and External Fragmentation.