Registration No. : | | | | | | | | | | |

Total number of printed pages – 3

B. Tech

PCCS 4304

Sixth Semester (Special / Back) Examination – 2013

OPERATING SYSTEM

BRANCH : CSE, IT

QUESTION CODE : E 296

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

(a) What are the main responsibilities of an Operating System ?

(b) What are the advantages of threads over multiple processes ?

(c) What is Process? What is the function of PCB ?

(d) What is Throughput, Turnaround time and waiting time ?

(e) What is a binary semaphore ? What is its use ?

(f) What is a race condition ?

(g) What is Context Switch ?

(h) What is mutual exclusion ?

(i) What is safe state ? When is a system in safe state ?

(j) Explain the difference between internal and external fragmentation.

P.T.O.

2. (a) Distinguish between multiprogramming and multiprocessing operating system. What are the key motivation for the development of each. 5

(b) Define the term process. How a process different from a program ? Explain the different states of a process with the help of process state diagram. 5

3. (a) Consider a set of three processes, P1, P2 and P3 with their CPU burst times in milliseconds.

Process	CPU burst time
P1	10
P2	5
P3	2

Assume time quantum q=2 ms. Find average waiting time using Round Robin Scheduling. 5

(b) Define mutual exclusion. How does semaphore solve mutual exclusion problem ? 5

4. (a) Consider the following page reference string : 5

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6.

How many page faults would occur for FIFO replacement algorithm, assuming 7 frames.

(b) What is the difference between a file organization and an access method ? Explain index sequential file with suitable example. 5

5. (a) What is a deadlock ? How can deadlock be avoided ? 5

(b) What is critical section problem? What are the major requirements that a solution to critical section problem must satisfy. 5

6. (a) Defne a solution to reader – writer problem using semaphore. 5

(b) What do you mean by thrashing ? Why thrashing occurs ? 5

7. (a) What is paging ? When do page fault occur ? Describe the action taken by the OS when page fault occurs ? 5

(b) What do you understand by virtual memory ? Explain how virtual memory concept is implemented using demand paging ? 5

8. Write short notes on any **four** of the following : 2.5×4

(a) Belady's Anomaly

(b) Segmentation

(c) Demand Paging

(d) Best-fit

(e) Spooling.