Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(CSE/IT) (2011 Onwards) (Sem.–4)

OPERATING SYSTEMS

Subject Code : BTCS-401

Paper ID : [A1183]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What do you mean by PCB?

b) List out different schemes for protection and security.

c) Differentiate between external fragmentation and internal fragmentation.

d) How the semaphores help in the process synchronization? What is the difference between binary and counting semaphore?

e) What do you understand by thrashing and its solution?

f) What is the purpose of system call?

g) Describe the booting process of an operating system.

h) Discuss the need of virtual memory.

i) What is the difference between Online and Real-time systems?

j) State objective of multiprogramming.

SECTION-B

2. What is the purpose of paging the page tables? Consider the following page reference string

1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5

for a memory with three frames. How many page faults would LRU and FIFO replacement algorithm?

3. Give memory partition of 100K ,500K, 200K, 300K and 600K (in order).How would each of the first fit, best fit and worst fit algorithm place process of 212 K, 417 K, 112K, and 426 K(in order)? Which algorithm makes the most efficient use of memory?

4. Define critical section. What are the requirements to solve critical-section problem?

5. What is disk scheduling? Explain the C-SCAN scheduling by giving an example.

6. Compare and contrast the terms external and operational security in the context of operating systems.

SECTION-C

7. Define the term process and differentiate between heavyweight and lightweight processes. Assume that following jobs have arrived in the order 1,2,3,4 and 5 :

Job	Arrival Time	Burst Time	Priority
1	0	15	2
2	2	03	1
3	5	05	5
4	6	08	4
5	7	12	3

Give Gantt chart and calculate Avg. Turn-around Time and Waiting Time for :

i) FCFS

ii) SJF scheduling and Preemptive priority algorithm. (10)

8. a) Define a file system. What are various components of a file system? State and explain various file allocation methods. (5)

b) What problems could occur of system allowed a file system to be mounted simultaneously at more than one location? (5)

9. Write short notes on :

a) Distributed operating systems (5)

b) Features of LINUX file system (5)