

B.Tech IV Year I Semester (R13) Supplementary Examinations June 2017

OPERATING SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- In multiprogramming and time-sharing environment, several users share the system simultaneously. In this situation what problems occur?
 - List the advantages and disadvantages of using the same system call-interface for manipulating both files and devices.
 - What actions are taken by a kernel to context-switch between processes?
 - Consider a system where counting semaphore initialized to +17, on this semaphore variable the various operations like 23P, 18V, 16P, 14V and 1P are performed. Then what is the final value of the semaphore?
 - A computer program has enough room to hold four programs in its main memory. These programs are idle waiting for I/O half time. What fraction of CPU time is wasted?
 - Consider a movie player application that supports functions like play movie, skip forward 'x' frames and skip backward 'x' frames. Suggest a memory management policy that will be best suited for this application.
 - In a multi user operating system 20 requests are made to use a particular resource per an hour on an average. What is the probability that no request made in 45 minutes?
 - It has been suggested that the first part of each UNIX file kept in the same disk block as its I-node. What good would this do?
 - Assume that the block size is 1KB, How many numbers of blocks are needed to hold bitmap of all the 20K blocks?
 - What are the different ways we can use the domain?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Write a c program using fork() system call that generates the Fibonacci sequence in the child process. The number of sequence will be provided in the command line.

OR

- 3 Explain in detail about different kernel data structures.

UNIT – II

- 4 What are the completion times of processes P_1 , P_2 and P_3 using SRTF (Shortest Remaining Time First)?

PID	Arrival Time	Burst Time		
		CPU	IO	CPU
P_1	0	1	2	2
P_2	1	2	4	5
P_3	2	3	6	8

OR

- 5 What are three conditions for critical section problem? Write the Peterson's solution that achieves all the three conditions with two processes and explain.

Contd. in page 2

UNIT – III

- 6 (a) Explain in detail about working set model with suitable example.
(b) In a paged memory, the page hit ratio is 0.35. The time required to access a page in secondary memory is equal to 100nS. The time required to access a page in physical memory is 10nS. What is the average time required to access a page?

OR

- 7 Consider a system with three processes and four resources. Resource R1 and R3 with one instance, R2 with two instance, process P1 holding an instance of R2 and waiting for r1, process P2 is holding an instance of R1 and R2 and waiting for R3, process P3 is holding an instance of R3.
(a) Draw resource allocation graph to the given system.
(b) Is it possible to apply the Resource allocation graph algorithm to avoid deadlock? Explain.

UNIT – IV

- 8 Explain different disk allocation methods in detail.
OR
9 What are the different techniques used to improve the efficiency and performance of secondary storage? Explain.

UNIT – V

- 10 (a) How to handle bad blocks in secondary storage?
(b) Disk request come to a disk driver for cylinder in order 10, 22, 20, 2, 40, 6 and 38. At a time when the disk driver is reading from cylinder 20. Seek time is 6mS per cylinder. What is the total seek time of disk if we apply FCFS scheduling algorithm?

OR

- 11 Explain in detail about access matrix along with its implementation.
