1058

B.E. (Computer Science and Engineering)
Fourth Semester
CS-403: Operating System

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt* five *questions in all, including Question No. I (Section-A) which is compulsory and selecting two questions each from Section B-C.*

x-x-x

Section-A

(a) How does a real-time system differ from time-share system?
(b) What are the differences between user-level threads and kernel-supported threads? Under what circumstances is one type "better" than the other?
(c) Why the page size has to be a power of two?
(d) Explain spooling with example.
(e) Write various goals of Security.

[2X5

Section-B

Assume the following workload in a system.

Job	Burst Time(ms)	Arrival Time	Priority
A	3	0	2
B	1	1	1
C	4	3	4
D	1	2	2
E	2	4	3

(a) Draw a Gantt chart illustrating the execution of these jobs using non preemptive priority (smaller priority no. implies a higher priority) and SRJF (shortest remaining job first) CPU scheduling.

(b) Calculate the average waiting time and average turnaround time for each of the above scheduling algorithm.

Show how Wait( ) and Signal( ) semaphore operation could be implemented in multiprocessor environment using Test() and Set() instruction. Explain with pseudo code.

[1

(a) Explain deadlock detection scheme for several instances of a resource type.
(b) Highlight the different techniques to recover the system from deadlock.

P-T-o

Section-C

(a) The address binding problem can be solved at compile time, load time or run time. For each case, explain what form the solution takes, and give one advantage and one disadvantage.

(b) Distinguish segmentation from paging.

Suppose that pages in a virtual address space are referenced in the following order:
3, 2, 5, 5, 4, 1, 6, 7, 1, 2, 2, 4, 2, 6, 2, 3, 4, 3, 2, 3, 5
Assume that paging decisions are made on demand, i.e., when page faults occur. Show the contents of the frames after each memory reference, assuming the FIFO replacement policy is used. Repeat assuming that the LRU replacement policy is used. How many page faults occur in each case with frame size 3 and 5?

(a) Compare functionalities of SSTF CSAN and C-LOOK disk scheduling algorithm.

(b) Explain the free space management using Bit Vector and Linked list methods.

x-x-x