Exam.Code:0931
Sub. Code: 33694

2076

B.E. (Electronics and Communication Engineering)

Seventh Semester

EC-711: Operating Systems

Time allowed: 3 Hours | Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 7 (Section-C) which is compulsory and selecting two questions each from Section A-B..

x-x-x

SECTION-A

1) Define operating system. List five services provided by an operating system. Explain how each provides convenience to the users. What requirement(s) characterize a real-time operating system? (10)

2) What does pre-emptive scheduling mean? How does it affect system performance in comparison to non-pre-emptive scheduling? Compute the average waiting time given the Round Robin scheduling algorithm with time quantum=3 and (P1, 0, 5), (P2, 2, 3), (P3, 3, 2), (P4, 4, 5), (P5, 5, 4) where the second component of the triple is the time arrival and the third component is the burst time. Use FCFS as tiebreaker if needed. (10)

3)
   a) Explain the concept of demand paging with neat diagram.
   b) Consider the page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3 and 6. How many page faults would occur for (i) LRU Replacement (ii) FIFO Replacement and (iii) Optimal Replacement algorithms respectively, assuming one, two, three, four, five, six or seven frames? Assume all the frames are initially empty (that is, first unique pages will all cost one page fault each). (2, 8)

SECTION-B

4)
   a) List eight file attributes that could be stored in a file system for each file in a typical multi-user operating system.
   b) Explain the linked and indexed memory allocation technique for secondary storage management. (5, 5)

5)
   a) What is deadlock in OS? List the conditions that lead to deadlock. How deadlock can be prevented?
   b) Explain the use of Banker's algorithm for multiple resources for deadlock avoidance with illustration. (5, 5)

6) What is a mobile operating system? Give examples of mobile device operating systems. Highlight the Features of an iOS as a mobile operating system. (10)

SECTION-C (Compulsory Question)

7)
   a) Consider a logical address space of 8 pages of 1024 words each, mapped onto a physical memory of 32 frames. Find the number of bits in the logical address and the physical address.
   b) What is meant by virtual memory? How is it different from swapping?
   c) What are system calls in an OS? Why are these needed? Explain.
   d) What are the important criteria in choosing a file organization?
   e) Explain the three time factors involved in positioning the disk head and reading/writing a disk block. (5x2=10)

x-x-x