[5058] - 407

T.E. (Information Technology)
OPERATING SYSTEM
(2012 Pattern) (314451) (Semester - II)

Time : 2½ Hours]   *[Max. Marks :70*

Instructions to the candidates:
   1)   *Answer Question 1 or 2, 3 or 4, 5 or 6, 7 or 8, 9 or 10.*
   2)   *Neat diagrams must be drawn wherever necessary.*
   3)   *Figures to the right indicate full marks.*
   4)   *Assume suitable data, if necessary.*

Q1) a)   Explain micro kernel design approach? How will you decide that your requirement meets the criteria for micro kernel design?   **[5]**

     b)   What resources are used when thread is created? How do they differ from those used when a process is created?   **[5]**

<div align="center">OR</div>

Q2) a)   Explain the concept of Context Switching with the help of neat diagram.**[5]**

     b)   Discuss multilevel feedback queue scheduling in UNIX.   **[5]**

Q3) a)   What is the purpose of command interpreter? Why it is usually separate from the kernel.   **[5]**

     b)   Explain message passing system for IPC and Synchronization.   **[5]**

<div align="center">OR</div>

Q4) a)   Write the structure of producer and consumer process in bounded buffer problem using semaphore and discuss how critical section requirements are fulfilled.   **[5]**

     b)   Provide two programming examples in which multithreading provides better performance than a single-threaded solution.   **[5]**

Q5) a) Consider the following page reference string: **[9]**

2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6

Calculate the no. of page faults for following page replacement algorithms.

i) FIFO

ii) Optimal

iii) LRU

Consider number of frames is 3.

b) Describe how Linux implements the following aspects of memory management. **[9]**

i) Virtual memory addressing.

ii) Page allocation.

iii) Page replacement algorithm.

iv) Kernel memory allocation.

OR

Q6) a) Explain Belady's anomaly with suitable example. **[4]**

b) What is cause of thrashing? How does the system detect thrashing? How the system can eliminate it? **[6]**

c) Explain the address translation mechanism in paging and segmentation.**[8]**

Q7) a) Assume a disk with 200 tracks and the disk request queue has random requests in it as follows: 55, 58, 39, 18, 90, 160, 150, 38, 184. Find the no. of tracks traversed and average seek length if **[8]**

i) FIFO

ii) SSTF is used and initially head is at track no. 100.

b) Explain different file organization techniques. **[8]**

OR

Q8) a) Why I/O buffering is needed? State and explain different approaches of I/O buffering. **[6]**

b) Is disk scheduling, other than FCFS, useful in a single user environment. Explain your answer. **[6]**

c) What are different disk performance parameters? **[4]**

Q9) a) With neatly labelled diagram explain embedded Linux system architecture. **[8]**

b) Explain following operations wrt NACH OS. **[8]**

    i) Modes of operations.

    ii) Multiprogramming.

<div align="center">OR</div>

Q10) Write short notes on: **[16]**

a) Ubuntu EDGE.

b) Android OS.

c) Service Oriented OS.

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