

[5353]-198

**T.E. (Information Technology) (Semester - II)****OPERATING SYSTEM**

(2012 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side 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]

OR

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) For the table given below, draw a Gantt chart illustrating the process execution using non preemptive priority scheduling. A larger no indicates higher priority. Calculate average waiting time. [5]

| Process | Arrival Time | Burst Time | Priority |
|---------|--------------|------------|----------|
| A       | 0            | 5          | 4        |
| B       | 2            | 4          | 2        |
| C       | 2            | 2          | 6        |
| D       | 4            | 4          | 3        |

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

OR

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 page reference string with 3 frames. [9]

A, B, C, D, E, C, D, A, F, G, H, I, G, H, I, E, D, E, D, B

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

- i) FIFO
- ii) OPTIMAL
- iii) LRU

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: 98, 183, 37, 122, 14, 124, 65, 67. Find the no of tracks traversed and average seek length if [8]

- i) FCFS
- ii) SSTF
- iii) SCAN

iv) C-SCAN is used and initially head is at track no 53.

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 u r answer. [6]

c) What are different disk performance parameter? [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

OR

Q10) Write short notes on : [16]

a) Ubuntu EDGE

b) Android OS

c) Service Oriented OS

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