

Total No. of Questions :10]

SEAT No. :

[Total No. of Pages :3

P1767

[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]

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) 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]

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]

P.T.O.

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.

OR

Q10) Write short notes on: [16]

a) Ubuntu EDGE.

b) Android OS.

c) Service Oriented OS.

