

Total No. of Questions : 10]

SEAT No. :

P3545

[5560]-198

[Total No. of Pages : 3

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.

Q1) a) Which of the following instructions should be privileged? **[5]**

- i) Set value of timer
- ii) Read the clock
- iii) Clear memory
- iv) Issue a trap instruction
- v) Turn off interrupts
- vi) Modify entries in device-status table
- vii) Switch from user to kernel mode
- viii) Access I/O device

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

Q3) a) For the table given below, draw a Gantt chart illustrating the process execution using non preemptive priority scheduling. **[5]**

A larger no indicates higher priority. Calculate average waiting time.

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

P.T.O.

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) Draw and explain UNIX process state transition diagram. [5]

Q5) a) Consider the page reference string with 3 frames. [9]

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

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

a) FIFO

b) OPTIMAL

c) 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) Consider a disk queue with I/O requests on the following cylinders in their arriving order: [8]

6, 10, 12, 54, 97, 73, 128, 15, 44, 110, 34, 45

The disk head is assumed to be at cylinder 23 and moving in the direction of decreasing number of cylinders. The disk consists of total 150 cylinders. Calculate and show with diagram the disk head movement using SCAN, C-SCAN, LOOK, C-LOOK disk scheduling algorithms.

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

