

Total No. of Questions : 12]

SEAT No. :

P832

[Total No. of Pages : 3

[4263] - 351

T.E. (I.T.)

OPERATING SYSTEMS

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer Three questions from Section - I and Three questions from Section - II.
- 2) Answers to the two sections should be written in separate answer books.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

SECTION - I

- Q1) a) Write functions of operating system. [6]
b) Explain following shell commands [4]
i) Chmod ii) Grep
c) What is distributed OS? Give its advantages over other types of operating systems. [6]

OR

- Q2) a) Explain monolithic and layered architecture. [8]
b) Write an AWK script to find frequency counts of each word in a text file. Assume each word is stored on a separate line. [4]
c) Write a shell script to search and delete a record from a file. Assume suitable record structure. [4]

- Q3) a) Draw and explain process state transitions. [6]
b) Draw Gantt chart and calculate turnaround time, waiting time for following processes using FCFS, SJF preemptive, SJF nonpreemptive and Round Robin CPU scheduling algorithms. (Round robin consider time quantum = 2) [12]

Process	Arrival Time	Burst time
P1	0	6
P2	1	4
P3	4	8
P4	3	3

P.T.O.

OR

- Q4)** a) Explain real time scheduling. [6]
b) Explain process scheduling used in UNIX. [8]
c) Explain the use of fork and vfork with example. [4]

- Q5)** a) What is deadlock? State and explain necessary conditions for deadlock. [6]
b) Write and explain semaphore solution to the reader's writer's problem. [10]

OR

- Q6)** a) Explain different strategies for deadlock recovery. [8]
b) What is critical section? Explain necessary conditions for the solution of critical section problem. [8]

SECTION - II

- Q7)** a) Explain Belady's anomaly with suitable example. [8]
b) For the following reference string calculate the number of page fault and page fault frequency using LRU and optimal page replacement policies with number of page frame = 3.
6, 5, 1, 2, 5, 3, 5, 4, 2, 3, 6, 3, 2, 1, 2 [10]

OR

- Q8)** a) Give similarities and differences between paged and segmented memory management schemes. [6]
b) Explain First Fit, Best Fit, Worst Fit, Next Fit memory allocation strategies with example. [12]

- Q9)** a) On a system using contiguous allocation, compute the number of physical block corresponding to the logical block given the file is stored starting at the indicated physical block (assume block number starts with 1).
i) starting physical block : 1000; logical block : 12
ii) starting physical block : 75; logical block : 2000
iii) starting physical block : 150; logical block : 25 [4]
b) Explain file system free space management in detail. [10]
c) State file system object types. [2]

OR

Q10) a) Consider a system in which a directory entry can store up to 16 disk block addresses. For files no larger than 16 blocks, the 16 addresses serve as the file's index table. For files larger than 16 blocks, the addresses point to the indirect blocks which in turn point to 256 file block each. A block size is 1024 bytes. How big can a file be. [4]

b) On a system with 1000 cylinders, numbered 0 to 999, compute the number of tracks the diskarm must move to satisfy all the requests in the disk queue. Assume the last request serviced was at track 345 and the head is moving toward track 0. The queue in FIFO order contains requests for the following tracks : 123, 874, 692, 475, 105, 376. Perform the computation for the algorithms :

i) FCFS

ii) SSTF

iii) SCAN

iv) LOOK

v) C-LOOK

vi) C-SCAN

[12]

Q11) a) Explain why reading an email without looking at attachments cannot cause a computer to become infected with a virus (assuming the email client program is not infected with a virus). [4]

b) Explain different security mechanisms in UNIX. [6]

c) Classify each of the following as authentication, prevention, detection, identification, correction, modification. [6]

i) A login program

ii) Scanning for recently modified files in a system directory

iii) Weekly backups

iv) Logging all logins and logouts

v) Promptly deleting unused accounts

vi) Adding to one bank account the entire fractional amount from all the other accounts.

OR

Q12) a) Explain different threat categories. [8]

b) Write different program threats. [8]
