

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name : Operating System

Subject Code : 4TE04OPS1

Branch: B.Tech (CE)

Semester : 4

Date : 26/04/2019

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1

Attempt the following questions:

- | | | |
|----|---|------|
| a) | What is Context switch? | (01) |
| b) | What is Degree of multiprogramming? | (01) |
| c) | What is Dispatch latency? | (01) |
| d) | Define the term Semaphore. | (01) |
| e) | What is Barrier? | (01) |
| f) | Define the term Deadlock. | (01) |
| g) | List out various page replacement algorithm that are suffering from Belady's anomaly. | (01) |
| h) | Define the term Thrashing. | (01) |
| i) | What is Temporal locality? | (01) |
| j) | Which process scheduling algorithms are suffering from starvation? | (01) |
| k) | What is the difference between local replacement and global replacement? | (01) |
| l) | What is difference between file and directory? | (01) |
| m) | What is domain structure? | (01) |
| n) | List out various program threats. | (01) |

Attempt any four questions from Q-2 to Q-8

Q-2

Attempt all questions

- | | | |
|-----|---|------|
| (a) | What is a system call? Discuss about how it is handled by an operating system. | (06) |
| (b) | Consider the following set of four processes. Their arrival time and time required to complete the execution are given in the following table. All time values are in milliseconds. Time quantum is 4ms and switching overhead is 1ms for round robin algorithm. Calculate average turnaround time and average waiting time using following algorithms: (1) FCFS, (2) SRTN, (3) Round robin, and (4) Non Pre-emptive Priority based scheduling. | (08) |

Process	Arrival time	Burst time	Priority
P1	0	10	5
P2	1	6	4
P3	3	2	2
P4	5	4	0



- Q-3 Attempt all questions**
- (a) Consider the following page reference string: 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 5, 4, 3, 4, 9, 3. How many page fault occur for following page replacement algorithm assuming frame size is 3. Also calculate hit ratio of given algorithms. Given algorithms are: (1) FIFO (2) LRU and (3) Optimal. (07)
- (b) Explain RAID with its types. (07)
- Q-4 Attempt all questions**
- (a) The requested tracks are received in the order of : 55, 58, 39, 18, 90, 160, 150, 190, 38, 184. Current position of arm is at 100 and previous was 95. There are 0 to 199 cylinders Apply the following disk scheduling algorithms (1) SSTF (2) SCAN (3) C-SCAN and derive total head movement for each algorithm. (07)
- (b) What is process state? Explain different states of a process with various queue generated at each stage. (07)
- Q-5 Attempt all questions**
- (a) What is thread? Explain different types of thread with its structure. (07)
- (b) Explain the use of Banker's Algorithm for deadlock avoidance with suitable example. (07)
- Q-6 Attempt all questions**
- (a) What is segmentation? Give difference between Paging and Segmentation. (07)
- (b) What is file? Explain various file attributes and file operations. (07)
- Q-7 Attempt all questions**
- (a) Explain various types of page table structure. (07)
- (b) Explain Access matrix with its implementation strategy. (07)
- Q-8 Attempt all questions**
- (a) Do as directed (07)
- (1) Explain various criteria where external devices differ.
- (2) Explain characteristics of I/O devices.
- (b) What is demand paging? Explain the mechanism of demand paging. (07)

