

Total No. of Questions : 8]

SEAT No. :

PD4323

[Total No. of Pages : 2

[6403]-121

T.E. (Information Technology)
OPERATING SYSTEMS
(2019 Pattern) (Semester - V) (314442)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable data wherever necessary.

- Q1)** a) Explain the Reader writer problem with the readers having priority and give a solution using semaphore and mutex. [8]
- b) Explain various strategies to deal with deadlocks. [9]

OR

- Q2)** a) State the Producer-Consumer problem and give a solution using semaphore and mutex. [7]
- b) Define and discuss : [10]
- i) Mutex
 - ii) Race condition
 - iii) Critical section
 - iv) Semaphore
 - v) Deadlock

- Q3)** a) For the reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 3, 6. Calculate the number of page faults with 3 frames using FIFO, LRU, and optimal page replacement methods. [9]
- b) Differentiate : [9]
- i) Logical and physical address
 - ii) Page table and segment table
 - iii) Static and dynamic partitioning

OR

- Q4)** a) Explain demand paging. Why do we need demand paging? [6]
- b) Explain thrashing with an example. How can it be handled? [6]
- c) Discuss the Internal and External Fragmentation with example. [6]

P.T.O.

Q5) a) Assume a disk with 400 tracks, and the disk request has random requests as follows: 53, 59, 42, 21, 310, 350, 380, 184. Find the no. of tracks traversed and average seek length if [9]

i) FIFO

ii) SSTF

iii) CLOOK is used, and initially head is at track no.100.

b) Why I/O buffering is necessary? State and explain different I/O buffering techniques. [8]

OR

Q6) a) Why free space management is required. Explain various Free space management techniques (at least 4) [9]

b) Explain different file organization techniques with their advantages and disadvantages. [8]

Q7) a) Categorize the overall compilation process in the form of various phases using suitable diagrams. Explain each phase in detail. [9]

b) Explain the data structures required for a two-pass assembler with their usage in detail. [9]

OR

Q8) a) Define System Software. How is it different from application software? List and explain important components of system software. [9]

b) Explain the following : [9]

i) Compile and Go Loader

ii) Direct linking loader

