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