R16

Time: 3 Hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A
(25 Marks)

1.a) Explain the functions of operating system. [2]
  b) Explain about the abstract view of the components of a computer system. [3]
  c) Distinguish between I/O bound process and CPU bound process. [2]
  d) What are the requirements of Critical section problem? [3]
  e) What is Demand Paging? [2]
  f) Distinguish between logical and physical address space. [3]
  g) Explain about the Acyclic graph directory. [2]
  h) Explain about the Solid state disk. [3]
  i) What is Access Control? [2]
  j) Explain how to eliminate the deadlocks using resource preemption. [3]

PART-B
(50 Marks)

2. Explain how operating systems are used in a variety of computing environments. [10]

OR

3.a) What is operating system? Explain multiprogramming and time sharing systems.
  b) Explain about the dual mode operation in OS with a neat block diagram. [5+5]

4.a) Explain about the Process Control Block.
  b) What is Semaphore? How can we achieve the synchronization using semaphore for producer consumer problem? [5+5]

OR

5.a) Discuss the Peterson's solution for the race condition with algorithm.
  b) What is the average waiting time and average turn around times of all processes for FCFS, SJF algorithm? [5+5]

Precesses	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

6.a) Consider the following page reference string
1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2
With four Frames. How many page faults would occur for the FIFO, Optimal page replacement algorithms? Which algorithm is efficient? (Assume all frame are initially empty)

  b) What is Thrashing? Explain the Causes of Thrashing.   [5+5]

OR

7.a) Consider the following reference string
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.
Assume there are three frames. Apply LRU replacement algorithm to the reference sting above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementation of the LRU algorithm.

  b) Explain about Swapping.   [5+5]

8.a) Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO order 86,1470,913,1774,948,1509, 1022, 1750, 130 starting from current head position. What is the total distance that disk arm moves to satisfy all the pending request for FCFS and SSTF disk scheduling algorithm.

  b) Explain about the system call for File operations.   [5+5]
OR
9. Explain the following disk scheduling algorithm with proper diagram
   a) FCFS
   b) SSTF
   c) SCAN
   d) LOOK
   e) C-SCAN.   [10]

10.a) Explain about the Language based Protection.
   b) Explain about the bankers algorithm for deadlock avoidance.   [5+5]
OR
11.a) Explain the protection mechanism illustrating the use of protection domain and access control list.
   b) What is deadlock? Explain the conditions that lead to deadlock.   [5+5]

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