**ORCHID INTERNATIONAL COLLEGE**

**SET A**

**Full Marks: 60**

## Time: 3 hrs

**Bijaychowk, Gaushala-9, Kathmandu**

**Pre Board Examination -2081**

**BIM /Fourth Semester / IT 241: Operating System**

***Candidates are required to answer the question in their own words as far as practicable.***

**Group "A"**

**Brief Answer Questions: [10×1=10]**

1. Explain critical region in IPC.
2. What is microkernel?
3. Explain disk access time.
4. What is malware?
5. Why access control list are important?
6. Explain Coalescing technique.
7. What is deadlock?
8. Explain Address Binding.
9. What is shared devices?
10. Explain New technology file system (NTFS)

**Group "B"**

**Exercise Problems: [5×3=15]**

1. Explain bad blocks with example.
2. How I-nodes are used in file allocation method?
3. Explain Distributed Operating system with its communication structure.
4. Explain one time password(OTP), and also explain why access control is important in security
5. Given the memory partitions of 250k, 400k, 200k, 300k and 600k (in order), how would each of the First-fit, Best-fit, Next-fit and worst-fit algorithm place processes of 212k, 417k, 112k, and 426k (in order)? Which algorithm makes the most efficient use memory?

**Group "C"**

**Comprehensive Answer Questions: [3×5=15]**

1. if we consider reference string 1,2,1,7,0,1,7,8,2,3,6,7,1,0,5,6,5,6,5 and number of frames allocated = 4. Using Second chance page replacement algorithm to find fault number and fault ration.
2. What is TSL (Test and Set lock) instruction? Explain mutual exclusion without busy waiting technique using wait and signal technique.
3. Consider an imaginary disk with 100 cylinders. A request come in to read a block on cylinder 21. While the seek to the cylinder 21 is in progress, new request come in for cylinders: 1,78,2,88,12,44,76,3,22,23,67,29,89, in the order. Calculate the total head movement with total cylinder moved using C-SCAN scheduling algorithm (using 6msec per cylinder moved)
4. What is paging hardware? Explain TLB-assisted translation with diagram.

**Group “D”**

**Long Answer Question: [2×10=20]**

1. Explain Banker’s algorithm for multiple resources. Consider a system with five process P0 through P4 and three resources type A,B,C. Resource type A has 15 , B has 10 And type C has 12.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Process | Allocation | | | Max | | |
| A | B | C | A | B | C |
| P0 | 3 | 2 | 1 | 6 | 5 | 3 |
| P1 | 1 | 0 | 1 | 3 | 2 | 2 |
| P2 | 4 | 3 | 2 | 8 | 3 | 2 |
| P3 | 2 | 1 | 1 | 5 | 2 | 2 |
| P4 | 1 | 0 | 2 | 4 | 3 | 3 |

* + 1. What will be the content of the need Matrix?
    2. Is the system in safe state? If yes, then what is the safe sequence?

1. Consider the following set of processers, with the length of the CPU burst given in milliseconds, draw Gantt chart illustrating their execution and calculate average waiting time and turnaround time using:
2. Shortest Job First(Preemptive/Non Preemptive)
3. Priority (Preemptive/Non Preemptive)
4. Round Robin (quantum=5)

|  |  |  |  |
| --- | --- | --- | --- |
| Process | Burst Time | Priority | Arrival |
| P0 | 8 | 2 | 1 |
| P1 | 3 | 1 | 4 |
| P2 | 10 | 2 | 0 |
| P3 | 1 | 3 | 10 |
| P4 | 3 | 1 | 14 |

**ORCHID INTERNATIONAL COLLEGE**

**SET B**

**Bijaychowk, Gaushala-9, Kathmandu**

**Full Marks: 60**

## Time: 3 hrs

**Pre Board Terminal Examination -2081**

**BIM /Fourth Semester / IT 241: Operating System**

***Candidates are required to answer the question in their own words as far as practicable.***

**Group "A"**

### Brief Answer Questions: [10×1=10]

1. Explain shared memory technique in IPC.
2. What is virtual devices?
3. Explain cylinder and sector of disk structure.
4. What is software vulnerabilities?
5. Why access control matrix are important?
6. Explain Compaction technique.
7. Explain Real time operating system
8. Explain Program Relocation.
9. Explain Real time operating system
10. Explain file allocation table (FAT).

**Group "B"**

### Exercise Problems: [5×3=15]

1. Explain RAID level with example.
2. Explain Interprocess communication in Distributed system with example.
3. Explain the model of secure system of operating system with example.
4. Explain continuous allocation and non-contiguous allocation method with example.
5. Given the memory partitions of 200k, 450k, 200k, 300k and 600k (in order), how would each of the First-fit, Best-fit, Next-fit and worst-fit algorithm place processes of 212k, 417k, 112k, and 426k (in order)? Which algorithm makes the most efficient use memory?

**Group "C"**

**Comprehensive Answer Questions: [3×5=15]**

1. if we consider reference string 1,2,1,7,0,1,7,8,2,3,3,2,4 and number of frames allocated = 4. Using C-LOOK page replacement algorithm to find fault number and fault ration.
2. What is printer spooler? Explain mutual exclusion without busy waiting using sleep and wakeup technique.
3. Consider an imaginary disk with 100 cylinders. A request come in to read a block on cylinder 21. While the seek to the cylinder 21 is in progress, new request come in for cylinders: 1,78,2,88,12,44,76,3,22,23,67,29,89, in the order. Calculate the total head movement with total cylinder moved using C-LOOK scheduling algorithm (using 5msec per cylinder moved)
4. What is segment table? Explain the basic differences between paging and segmentation.

**Group “D”**

**Long Answer Question: [2×10=20]**

1. Explain safe/unsafe algorithm for multiple resources. Consider a system with five process P0 through P4 and three resources type A,B,C. Resource type A has 15 , B has 10 And type C has 12.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Process | Allocation | | | Max | | |
| A | B | C | A | B | C |
| P0 | 2 | 2 | 1 | 6 | 5 | 3 |
| P1 | 4 | 0 | 1 | 4 | 2 | 2 |
| P2 | 3 | 3 | 2 | 8 | 3 | 2 |
| P3 | 3 | 1 | 1 | 4 | 2 | 2 |
| P4 | 3 | 0 | 2 | 5 | 3 | 3 |

1. What will be the content of the need Matrix?
2. Is the system in safe state? If yes, then what is the safe sequence?
3. Consider the following set of processers, with the length of the CPU burst given in milliseconds, draw Gantt chart illustrating their execution and calculate average waiting time and turnaround time using:
4. Shortest Job First(Preemptive/Non Preemptive)
5. Priority (Preemptive/Non Preemptive)
6. Round Robin (quantum=5)

|  |  |  |  |
| --- | --- | --- | --- |
| Process | Burst Time | Priority | Arrival |
| P0 | 15 | 2 | 1 |
| P1 | 3 | 1 | 8 |
| P2 | 6 | 2 | 0 |
| P3 | 7 | 3 | 10 |
| P4 | 3 | 1 | 12 |