CCI 4102 **OPERATING SYSTEM CAT 1**

**QUESTION 1**

1. Describe any two general roles of an operating system, and elaborate on their importance. [4marks]
2. Explain the relationship between an operating systems and computer hardware. (2marks)
3. i) State any two-page replacement algorithms the operating system use todecide which page needs to be replaced when a new page comes in memory. (2 mark)

ii)Consider the following page reference string of size 12: 1, 2, 3, 4, 5, 1, 3, 1, 6, 3, 2, 3 with frame size 4 (i.e. maximum 4 pages in a frame). Using any page replacement algorithm, you have cited in question c i), demonstrate how the operating system select the pages to be replaced so as to minimize the total number of page misses, hence calculate its Page Fault ratio. (4marks)

1. Explain the following operating system concepts, (3 marks)
   1. Kernel
   2. Starvation
   3. Race condition

OPERATING SYSTEM CAT 2

1. Multi-programming (or multi-tasking) enables more than a single process to apparently execute simultaneously. How is this achieved on a uniprocessor? (2 marks)
2. Explain your understanding of thrashing, hence state how it might be detected (2 marks)
3. Demonstrate your understanding of device drivers in operating systems (2marks)
4. Find the average waiting time for executing the following processes using
   * 1. First-come first-service, (1 marks)
     2. Shortest job first (2marks)
     3. Round robin with a time quantum of 3 seconds (2marks)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Process | Burst time |  |
|  | P0 | 7 |  |
|  | P1 | 5 |  |
|  | P2 | 2 |  |
|  | P3 | 9 |  |

1. With the aid of a diagram, describe the operating system process execution states.
2. Describe the difference between external and internal memory fragmentation
3. Explain windows file system (2marks)
4. State any two attributes of a file used in OS (2marks)