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| **SESSION** | **March 2024** |
| **PROGRAM** | **BACHELOR of COMPUTER APPLICATION (BCA)** |
| **SEMESTER** | **II** |
| **course CODE & NAME** | **DCA1201 – OPERATING SYSTEM** |
| **CREDITS** | **4** |

**Assignment Set – 1st**

**Questions**

**1. Explain the evolution of operating systems. Write a brief note on operating system structures**

**Ans:**

**Evolution of Operating Systems:-**

**1 Simple Batch Operating Systems**

In the earliest days digital computers usually run from a console. I/O devices consisted of card readers, tape drives and line printers. Direct user interaction with the system did not exist. Users made a job consisting of programs, data and control information. The job was submitted to an operator who would execute the job on the computer system.

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**Memory layout for simple batch system**

To speed up processing, jobs with the same needs were batched together and executed as a group.

For example, all FORTRAN jobs were batched together for execution; all COBOL jobs were

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**2. What is Scheduling? Discuss the CPU scheduling algorithms.**

**Ans:** The main objective of multiprogramming is to see that some process is always running so as to maximize CPU utilization whereas in the case of time sharing, the CPU is to be switched between processes frequently, so that users interact with the system while their programs are executing. In a uniprocessor system, there is always a single process running

**3. Discuss Inter process Communication and critical-section problem along with use of semaphores.**

**Ans:Inter process Communication (IPC)**

Inter process Communication (IPC) is a mechanism that allows processes to communicate with each other and synchronize their actions. Various IPC techniques exist, each suitable for different types of tasks and requirements.

**Some common IPC methods include:**

**Pipes:** A pipe is a unidirectional communication channel that can be used to connect the output of one process to the input of another.

**Message Queues:** This allows processes to send and receive messages in a queue. Messages

**Assignment Set – 2nd**

**Questions**

**4. A. What is a Process Control Block? What information does it hold and why?**

**Ans:** Process Control Block Every process has a number and a process control block (PCB) represents a process in an operating system. The PCB serves as a repository of information about a process and varies from process to process. The PCB contains information that makes the process an active entity. A PCB is shown in Figure 1.

**It contains many pieces of information associated with a specific process, including these:**

**• Process state**: The state may be new, ready, running, and waiting, halted and so on.

**b. What is thrashing? What are its causes?**

**Ans:Thrashing**

When a process does not have enough frames or when a process is executing with a minimum set of frames allocated to it which are in active use, there is always a possibility that the process will page fault quickly. The page in active use becomes a victim and hence page faults will occur again and again. In this case a process spends more time in paging than

**b. What are I/O Control Strategies?**

**Ans:**I/O Control Strategies Several I/O strategies are used between the computer system and I/O devices, depending on the relative speeds of the computer system and the I/O devices. The simplest strategy is to use the processor itself as the I/O controller, and to require that the device follow a strict order of events under direct program control, with the processor waiting

**6. Explain the different Multiprocessor Interconnections and types of Multiprocessor Operating Systems.**

**Ans:**Multiprocessor Interconnections The nature of multiprocessor interconnections has an effect on the bandwidth for communication. Complexity, cost, IPC and scalability are some features considered in interconnections.

Basic architectures for multiprocessor interconnections are as follows:

• Bus-oriented systems

• Crossbar-connected systems

• Hyper cubes