AMRITSAR GROUP OF COLLEGES
(AUTONOMOUS COLLEGE)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B. Tech. (CSE-I) 4th SEM
OPERATING SYSTEM
ACCS - 16402
Assignment-1

Total Marks: 24

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Section-A

(6*2=12)

Q1.

a) Differentiate between multiprogramming and multiprocessing?[CO5]

Ans: Multiprogramming:- Multiprogramming is more than one process runing at a time it increases CPU utilization by organizing job so that the CPU always has one to execute. To motive is keep multiple jobs in main memory.

Multiprocessing:- The availability of more than one processor per system, that can execute several set of instructions in parallel is known as multiprocessing.

b) What is process synchronization? Discuss about critical section problem.[CO9]

Ans: Process synchronization:- Is the task of coordinating the ~~executing~~ execution of process in a way that no two Process can have to the ~~sh~~same shared data and resource it is specially in a multi-process system when multiple Processes are runing together.

Critical section problem:- A critical section is a segment of code which can be accessed by a signal process at a specific point of time. The section consits of shared data resources that required be accessed by other process.

c) Differentiate between preemptive and non-preemptive scheduling?[CO2]

Ans: Preemptive shedluing:- (i) The CUP allocated to a process for a limited time. (ii) process can be interrupted in between.

(iii) used in time sharing system

(iv) CPU utilization is higher than non-preemptive scheduling

Non-Preemptive scheduling:- The CPU allocated to a Process unit it terminate or swithes to waiting state. Process can not be interpreted until its terminate or swiths to waiting state.

d) What do you mean by process control block? What information does it contain?[CO1]

Ans: A process control block (PCB) is a data structure used by computer operating systems to store all the information about a process. it is also known as a process discribe to when a process is created (initialized) or installed). The operating information contains in this process i.e registers Quantum, priority, etc. In this process control stores many data itemes that are needed for efficient process management.

e) Describe Round Robin with example .[CO2]

Ans: In this scheduling Time Quantum is given and we have to made rady Queue of Runing Queue its a preempting scheduling which every process get execute in a cyclic way.

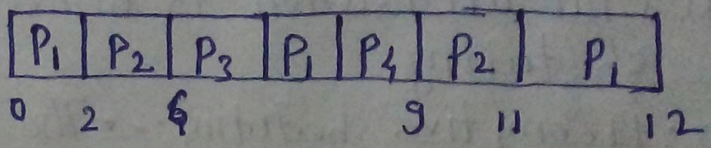
Example:-

Process	AT	BT	CT	TAT	WT
P_1	0	5 3 1	12	12	7
P_2	1	4 2	11	10	6
P_3	2	2	6	4	2
P_4	4	1	9	5	2

Avg = 7.5 wt = 4.7

Ready Queue

Runing queue



f) Define Turnaround time, Waiting time, Response time.[CO2]

Ans:

→ Turnaround time:- {completion time - arrival time}

→ Waiting time:- {Trunaround time - Burst time}

Response time:- {The time at which a process get cpu first time) - (Arrival time)}.

Section-B

(3*4=12)

Q2. Explain Producer/Consumer problem with example in process synchronization.[CO9]

Ans: The producer consumer problem is a sinchranization Problem There is a fixed size buffer and the producer Producers items and enters them into buffer. and consumers them. A producers should not producer item into the buffer when the consumer is consuming an item from the buffer and vice versa. so buffer should any be accessed by the procedure or consumer at a time the procedure consumer Problem can be resolved using semaphores. semaphorse is an atomic action wait/signal and wait/signal that are used for process synchronization

```
int s=1
wait () ⇒ s--
signal () ⇒ s++
s1 = 1
wait.s
{
while (s<=0);
s = s-1;
}
```

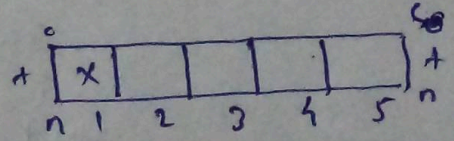
```
signal (s)
{
s = s++;
}
void producer()
{
while (True)
}
```

```
{
 producer()
 wait(s)
  wait(s)
  append(x)
  signal(s)
  signal(s)
   }
   }
 void consumer()
   {
    while (True)
    {
     wait(f)
      wait(s)
       take(*)
       signal(s)
       signal(s)
       signal(e)
         use()
         }
         }
```

S = 1 0 1 0 1 0 1

(empty) e = 5 4 3 4

(full) f = 0 1 2 1 0



consumer procedure

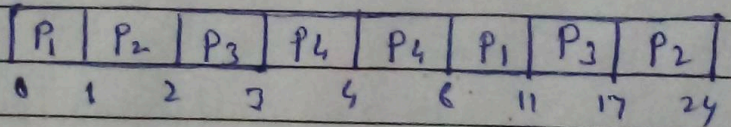
Q3. What do you mean by SJF? Explain with example (Preemptive and non-preemptive).[CO2]

Ans: Shortest Job first (SJF) is an algorithm in which the Process having the smallest execution time is chosen for an non-preemptive it significantly reduces the Average waiting time for other process awaiting execution there are basically two types of sjf method

- preemptive sjf
- NON-preemptive sjf

Process	Arrival Time	BT	CT	TAT	WT
P_1	0	6 5	11	10	5
P_2	1	8 7	24	23	15
P_2	2	7 6	7	5	3
P_4	3	3 2	6	3	0
				= 1.25	= 5.7

Grant chart



Q4. What is deadlock? State necessary conditions for deadlock characterization.[CO3]

Ans: A deadlock is a condition that may happen in a system composed of multiple process that can access shared recources. A deadlock is said to occur when two or more process are waiting for each other to release a resource. None of the process can make any proceess. There are four ~~cod~~ conditions necessary for the accurrence of a dedalblock.

Mutual execution:- When two people meet in the hanging they can't yest walk though because there is

space only for one person. This codition to allow only one person (or process) to use the step between them or the resource is the first condition necessery for the occurrence of the deadlock.

Hold and wait :- when the 2 people refuses and hold their grounds it is cotting called holding. This is the next necessory condition for the deadlock

No preemption :- for resolving the deadlock one can simply cancel on of the process for other to continue But operating system doesn't to so. It all actes the resources to the processers for as much time added until the task is completed. Hence, there is no temporary reallocation of the resources.

circular wait :- when the two people refuses to retreat and for each other to retreat, so that they can complete their task, it is called circular wait It is the last condition for the deadlock to occur.