Roll No. _____

Pandit Deendayal Petroleum University
School of Technology

Mid Semester Examination

B. Tech. (Computer Engineering/ICT)
Date: 24/09/2018
Course Name : Operating Systems

Semester – V
Time: 10.00 am to 12.00 Noon
Course Code : 18CP301T
Max. Marks: 50

Instructions:
1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever necessary and mention your assumptions clearly.
3. Write appropriate units, nomenclature and draw neat sketches/schematics, wherever required.
4. Answer all parts of a question continuously.

Q.1 **Answer the Following (Attempt any four, 5 Marks each)** **[20]**

1. List the strategies for handling deadlock and explain deadlock prevention technique.
2. List and explain process attributes.
3. Explain with diagram different states of a process.
4. List and explain important time related parameters used in scheduling algorithms.
5. Write short note on System calls.
6. List all scheduling algorithms and explain Round Robin scheduling algorithm.

Q.2. **Answer the Following (Attempt any FOUR, 5 marks each)** **[20]**

1. Three processes arriving at time zero with total execution time of 10, 20 and 30 units respectively. Each process spends first 20 % of execution time doing I/O, 60 % time doing computation and last 20 % time doing again I/O. compute percentage of idle time for SRTF.

2. For pre-emptive priority scheduling algorithm, process priority, Arrival Time and Burst Time is given as follows, calculate the Total Completion Time, average Turn Around Time, Average Waiting Time and Average Response Time.

Process No.	Priority	AT	BT
1	2 (L)	0	4
2	4	1	2
3	6	2	3
4	10	3	5
5	8	4	1
6	12 (H)	5	4
7	9	6	6

L→ Low Priority and H→ High Priority

3. A computer system has 6 CDROMs, with N processes competing for them. Each process needs 3 CDROMs. What is the maximum value of N for which system is guaranteed to be deadlock free?

4. Let m[0]….m[4] be mutexes (Binary Semaphores) and P[0]…P[4] be processes.
Suppose each process P[i] executes the following

```
Wait (m[i]); Wait(m[i+1]mod4)
      <Critical Section>
Release(m[i]); Release(m[i+1]mod4)
```

Show the outcome of it with all details and how many pairs of processes could be in critical section at any point of time?

5. Let m[0]....m[3] be mutexes (Binary Semaphores) and P[0]...P[3] be processes. Suppose each process P[i] executes the following

```
Wait (m[i]); Wait(m[i+1]mod4)
        <Critical Section>
Release(m[i]); Release(m[i+1]mod4)
```

Will there be Deadlock or Starvation? What changes you will do to get in line with Dining Philosopher problem? Give the execution sequence of processes, if it is possible to execute all processes.

Q.3 Answer the Following (ANY TWO) **[10]**

1. Explain Peterson's algorithm for handling synchronization mechanism.
2. Differentiate between process and thread, how is Kernel level thread different compared to User level thread?
3. Explain Producer consumer problem with pseudo algorithm and how will you overcome it.