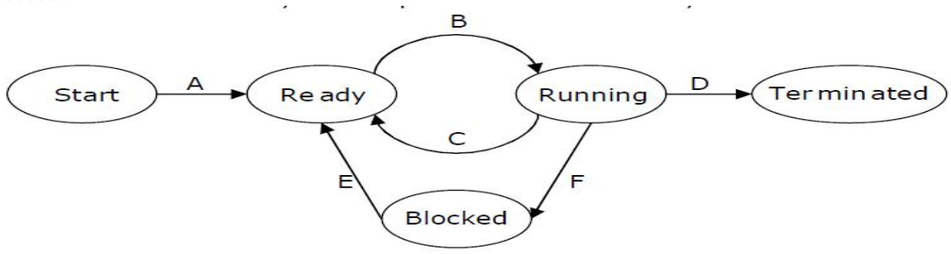
DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VI [INFORMATION TECHNOLOGY]
SUBJECT: (IT 607) Applied Operating System

Examination	**First Sessional**	**Seat No.**	**:**
Date	**20/01/2016**	**Day**	**: Wednesday**
Time	**12:30 - 01:45**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. **Figures to the right indicate maximum marks for that question.**
2. **The symbols used carry their usual meanings.**
3. **Assume suitable data, if required & mention them clearly.**
4. **Draw neat sketches wherever necessary.**

Q.1 Do as directed.

(a) **[2]**



In the above process state transition diagram for a uni-processor system, assume that there are always some processes in the ready state. Now consider the following statements:
I. If a process makes a transition D, it would result in another process making transition A immediately.
II. A process P2 in blocked state can make transition E while another process P1 is in running state.
III. The OS uses preemptive scheduling.
IV. The OS uses non-preemptive scheduling.
Which of the above statements are TRUE?
(1) I and II (2) I and III (3) II and III (4) II and IV

(b) State the importance of preempted state in unix 9 state process model. **[2]**
(c) What is deferred cancellation? How is it better than asynchronous cancellation? **[2]**
(d) Write prototype (function header) of pthread_create function and explain its arguments. **[2]**
(e) Consider three CPU-intensive processes, which require 10, 20 and 25 time units and arrive at times 0, 2 and 4, respectively. How many context switches are needed if the operating system implements a preemptive shortest job first scheduling algorithm? Do not count the context switches at time zero and at the end. **[2]**
(f) Differentiate between hard real time and soft real time operating systems. **[2]**

Q.2 Attempt *Any TWO* of the following questions. **[12]**

(a) Draw Gantt Chart for Shortest Remaining Time First scheduling algorithm. Also find Average Waiting Time and Average Turnaround Time. **[6]**

Process	Burst time	Arrival time
P1	20	0
P2	25	15
P3	10	30
P4	15	45

(b) Draw Gantt Chart for Round Robin scheduling algorithm. Consider Time Quantum=2. Also find Average Waiting Time and Average Turnaround Time. **[6]**

Process	Burst time	Arrival time
A	3	0
B	6	1
C	4	4
D	2	6

(c) (1) Discuss various services provided by operating system. **[4]**
(2) Discuss advantages of multiprocessor operating system. **[2]**

Q.3 (a) Draw and discuss User Level Thread and Kernel Level Thread. Also discuss advantages and disadvantages of both. **[6]**
(b) Draw and discuss 7 state process model. **[6]**

OR

Q.3 (a) Discuss working of RPC using suitable diagram and discuss three major issues in implementation of RPC. **[6]**
(b) (1) Discuss uses of various types of process schedulers. **[3]**
(2) Discuss uses of fork, exec and wait system calls related to process with example. **[3]**