Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

Mid Semester Examination

March 2018

Max. Marks: 30 — Duration: 1.5Hrs

Class: SE — Semester:IV

Course Code: CE43/IT44 — Branch:Computer/IT

Name of the Course: Operating Systems

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q No.		Max. Marks	CO

Q.1(A)	How many new processes are created by the program shown below? Justify your answer with formula.
	#include<stdio.h>
	#include <unistd.h>
	int main()
	{ int i;
	for (i = 0; i <10; i++)
	fork();
	return 0;
	}
		2	CO1

Q.1(B)	Write in short any four services provided by OS.	4	CO1
Q.2	Consider three processes (process id 0, 1, 2 respectively) with compute time bursts 2, 4 and 8 time units. All processes arrive at time zero. Consider the longest remaining time first (LRTF) scheduling algorithm (pre-emptive). In LRTF ties are broken by giving priority to the process with the lowest process id. Find the average turn around time and average waiting time with neat Gantt chart. **OR** Consider the following workload: **Process / Burst Time / Priority / Arrival Time** P1 / 50 ms / 4 / 0 ms P2 / 20 ms / 1 / 20 ms P3 / 100 ms / 3 / 40 ms P4 / 40 ms / 2 / 60 ms a. Draw Gantt chart for Round Robin Scheduling algorithm with quantum 30 ms. b. Find the average waiting time and average turn around time.	5	CO2
Q.3	Explain process state transition diagram.	5	CO2

<table>
<tr><td>Q.4</td><td>Consider following scenario.

<table>
<tr><td colspan="4">Total resources in system</td><td colspan="4">Available resources</td></tr>
<tr><td>A</td><td>B</td><td>C</td><td>D</td><td>A</td><td>B</td><td>C</td><td>D</td></tr>
<tr><td>6</td><td>5</td><td>7</td><td>6</td><td>3</td><td>1</td><td>1</td><td>2</td></tr>
</table>

<table>
<tr><td>Process</td><td colspan="4">Allocation</td><td colspan="4">Maximum</td></tr>
<tr><td></td><td>A</td><td>B</td><td>C</td><td>D</td><td>A</td><td>B</td><td>C</td><td>D</td></tr>
<tr><td>p1</td><td>1</td><td>2</td><td>2</td><td>1</td><td>3</td><td>3</td><td>2</td><td>2</td></tr>
<tr><td>p2</td><td>1</td><td>0</td><td>3</td><td>3</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>p3</td><td>1</td><td>2</td><td>1</td><td>0</td><td>1</td><td>3</td><td>5</td><td>0</td></tr>
</table>

Find out the contents of need matrix using Banker's algorithm and check for safe sequence if any.
What would have happened if process P2 was holding 1 more unit of resource B at the beginning?</td><td>6</td><td>CO3</td></tr>
<tr><td>Q.5</td><td>Consider the following scenario.
Repeat
flag[i]=true;
turn=j;
while(p);
critical section
flag[i]=false;
remainder section
until false.
What should be the value of p to solve critical section problem along with its requirements?

OR

What are the requirements for the solution to the critical section problem.?
Consider following scenario and justify whether following solution is deadlock free or not.
void enter_cs(x)
{
while (test_and_set(x));
}
void leave_cs(x)
{
x=0;
}
x is memory location associated with critical section (cs) and is initialized to 0.</td><td>5</td><td>CO3</td></tr>
<tr><td>Q.6</td><td>Differentiate between Monitors and Semaphores for 3 different points.</td><td>3</td><td>CO3</td></tr>
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