University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Spring-2021

Program: B.Sc. in CSE

Course Title: Operating System Course No. CSE 405 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Three** Questions. **Answer all of them.**

<table>
<tr><td>1.</td><td>a.</td><td>If you design an Operating System, what will be your design goal? Describe the Computer System structure and describe the role of OS in your own words.</td><td>[10]</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>In your opinion which one is better: Symmetric or Asymmetric multi-processing systems? What are their fundamental differences?</td><td>[10]</td><td>CO1</td></tr>
<tr><td>2.</td><td>a.</td><td><table><tr><td>Process</td><td>Burst Time</td><td>Arrival Time</td><td>Priority</td></tr><tr><td>P</td><td>10</td><td>0</td><td>2</td></tr><tr><td>Q</td><td>5</td><td>7</td><td>1</td></tr><tr><td>R</td><td>8</td><td>9</td><td>3</td></tr><tr><td>S</td><td>7</td><td>10</td><td>4</td></tr></table>Apply pre-emptive priority scheduling for the given scenario and prepare the grant chart and calculate the average waiting time.</td><td>[10]</td><td>CO2</td></tr>
<tr><td></td><td>b.</td><td><table><tr><td>Process</td><td>Burst Time</td><td>Arrival Time</td></tr><tr><td>A</td><td>8</td><td>3</td></tr><tr><td>B</td><td>4</td><td>0</td></tr><tr><td>C</td><td>5</td><td>4</td></tr><tr><td>D</td><td>9</td><td>5</td></tr></table>Apply round robin algorithm (Quantum = 4) for the given scenario and prepare the grant chart and calculate the average waiting time.</td><td>[10]</td><td>CO2</td></tr>
<tr><td>3.</td><td>a.</td><td>What are the different states of a process?</td><td>[10]</td><td>CO1</td></tr>
</table>

		Draw a transition diagram describing the states of a process explaining the transition between various states.		
	b.	Write a program using the fork system call where *n* cumber of child processes are created using the same parent process and each child process will print: "I am child of "parent id" and my id is "The child id" And the parent will print: "I am parent of "n" number of child and my id is "parent id"	**[10]**	**CO2**
		OR		
	a.	What are the two types of Schedulers? Which one is responsible for multi-processing? Explain. Explain the difference between protection and security? Give real life example.	**[10]**	**CO1**

	b.	What will be the outcome of the following code? Mention the two possible variations.
		`#include <stdio.h>`
		`#include <sys/types.h>`
		`#include <unistd.h>`
		`void fork_exp()`
		`{`
		`int x = 1;`
		`if (fork() == 0)`
		`printf("Child has x = %d\n", ++x);`
		`else`
		`printf("Parent has x = %d\n", --x);`
		`}`
		`int main()`
		`{`
		`fork_exp();`
		`return 0;`
		`}`
			[10]	**CO2**