EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term I Examination, Spring 2022

Course: **CSE325 – Operating Systems, Section-2**
Instructor: **Md. Nawab Yousuf Ali, PhD, Professor, CSE Department**
Full Mark: **20**
Time: **1 Hour and 20 Minutes**

Note: There are FIVE questions, answer ALL of them. Course outcomes (CO), cognitive levels and marks of each question are mentioned at the right margin.

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1. There are four processes namely P0, P1, P2, and P3. Input, output, and the CPU burst time for each process (in milliseconds) are given in the following table. [CO1, C3, Mark: 8

	P0	P1	P2	P3
Input	4	8	11	9
CPU burst time	11	17	18	6
Output	3	6	3	7

Illustrate the graphical representations and calculate the execution times of the processes in

a) Batch processing system
b) Time shared processing system (time quantum is 12)

2. Find the output for the following program. Show all necessary steps of the execution. [CO1, C3, Mark: 4]

```
#include <unistd.h>
#include <stdio.h>
int main()
{
 pid_t pid;
   pid_t pid1;
   pid_t pid2;
   pid = fork();
   if (pid==0)
   { pid1=fork();
   printf("East West University\n");
   }  else if (pid1<0)
   { pid2=fork();
   printf("CSE Department\n");
   }
   else {
  printf("EWU reopens on February 27, 2022");
  } }
```

3. Suppose in a computer system, various I/O devices generate 4 maskable and 3 non maskable interrupts requests concurrently. Design a diagram and show how the system handles those different types of interrupts. [CO1, C3, Mark: 4]

4. Suppose you are performing a calculation (e.g., 5-2*2+3) using a calculator software. You clicked the buttons for necessary operands and operators for this calculation. Then the software calculated and showed you the output on the screen. Briefly explain in which state/states the process was in given scenario. [CO2, C3, Mark: 3]

5. Suppose in a multiprocessing system, four threads namely T1, T2, T3, and T4 are running with four different processors namely CPU1, CPU2, CPU3, and CPU4 respectively. Design the diagrams and show the implementation of the threads with the following methods when one or more threads are waiting for I/O operations. Justify your reasons. [CO1, C3, Mark: 6]
   Implementing threads:
   a) One to one
   b) Many to one and
   c) Many to many