**Department of Computer Science and Engineering**

**A**

**Final Examination Fall 2022**

**CSE 321: Operating Systems**

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| **Duration:** 2 Hours | **Total Marks:** 40 |

Answer the following questions.

Figures in the right margin indicate marks.

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| **1.**  **CO4** | **a)** A system has processes to execute of which **50%** is parallel. If the number of cores is increased from **1** to **4**, what will be the **increase** in performance?  **b) Distinguish** between **many-to-many** and **many-to-one** multithreading models. | [2]  [2] |
| **2.**  **CO5** | **a)** Suppose a faculty member can take a maximum of 5 groups of students for doing a thesis under him in a semester. In a particular semester, a total of 9 groups applied for doing a thesis under his supervision. Among them, he selected 5 groups and kept the rest of the other groups on a waiting list for the next semester where groups will be selected according to a first come first serve manner from the waiting list if any of his slots gets free. **Logically explain** which synchronization method has been used here.  **b)** For Peterson’s problem below conditions will be applied.   * There are two processes: P1 and P2. * Each Statement takes 3ms to execute. * Context Switch will occur after 9ms. * Both the Critical & Remainder section contains 3 statements. * For P1: i=0 and j=1 * For P2: i=1 and j=0 * turn=0 * flag[0] = FALSE, flag[1] = TRUE   **The structure of process Pi in Peterson’s solution:**   |  | | --- | | do{  flag[i] = true;  turn = j;  while(flag[j] == true && turn == 1){  //busy wait  }  //critical section  flag[i] = false;  //remainder section  }while(true); |   **Complete** the table given below for processes P1 and P2 using **Peterson’s solution.**   |  |  | | --- | --- | | Process 1: i=0, j=1 | Process 2: i=1, j=0 | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | [2]  [4] |