CS-C3140 Operating systems

The exam contains five questions. The maximum points for each question are listed in the beginning of the questions. Read the questions carefully. Give clear and compact answers. Remember to write the name of the course and your own personal information on each of your answer papers. No extra appliances are allowed in the exam.

1 (10p) Answer *shortly* with clear definitions and descriptions. (Max. two points per subquestion.)

a) What is a process table?
b) What is an interrupt mask?
c) What is a condition variable?
d) What is LRU?
e) What is a dispatcher?

2 (6p) Considering the *producer–consumer* problem, give a solution that implements mutual exclusion using *semaphores* as the synchronization mechanism. Present your solution as a piece of pseudo code and explain it.

3 (4p) What conditions must be satisfied by a system in order for a deadlock to be able to occur?

4 (6p) Describe the typical implementation of memory protection as an operating system service in modern systems. Include the related operating system structures, the hardware support, and their (co)operation in your description.

5 (6p) Write an essay that is not longer than 50 lines on scheduling.