Universidad de Guadalajara

Centro Universitario de Ciencias Exactas e Ingenierías

Examen parcial #1
Programación de Sistemas Embebidos - I7266

Nombre: _____ Fecha: _____

You have 20 minutes to answer as many of the following questions as you can. Each question gives you a certain number of points, you will only obtain them if your answer is correct, if your answer is partially correct, you will obtain a proportional part of the points.

1. Describe the primary function of a microcontroller in an embedded system. (10 points)
2. What is a register? (5 points)
   (a) What are registers used for? (10 points)
   (b) What are the differences between registers and RAM memory? (10 points)
3. What do you understand by *microcontroller architechture*? (15 points)
4. Explain the differences between *volatile* and *non-volatile* memory. (5 points)
   (a) Is RAM volatile? What does RAM mean and what is it used for? (10 points)
   (b) Is ROM volatile? What does ROM mean and what is it used for? (10 points)
5. What is an interrupt? (5 points)
   (a) What is the difference between a software interrupt and a hardware interrupt? (10 points)
   (b) What is the advantage of an interruption against polling for an event? (10 points)
6. In an 16-bit microcontroller, the last reachable address is `65,535` in decimal. In a 32-bit microcontroller, what would be the last addressable memory location? (15 points)

7. Why do we need a compiler and how does a compiler work? (20 points)
8. In the following diagram