16.317: Microprocessor Systems Design I

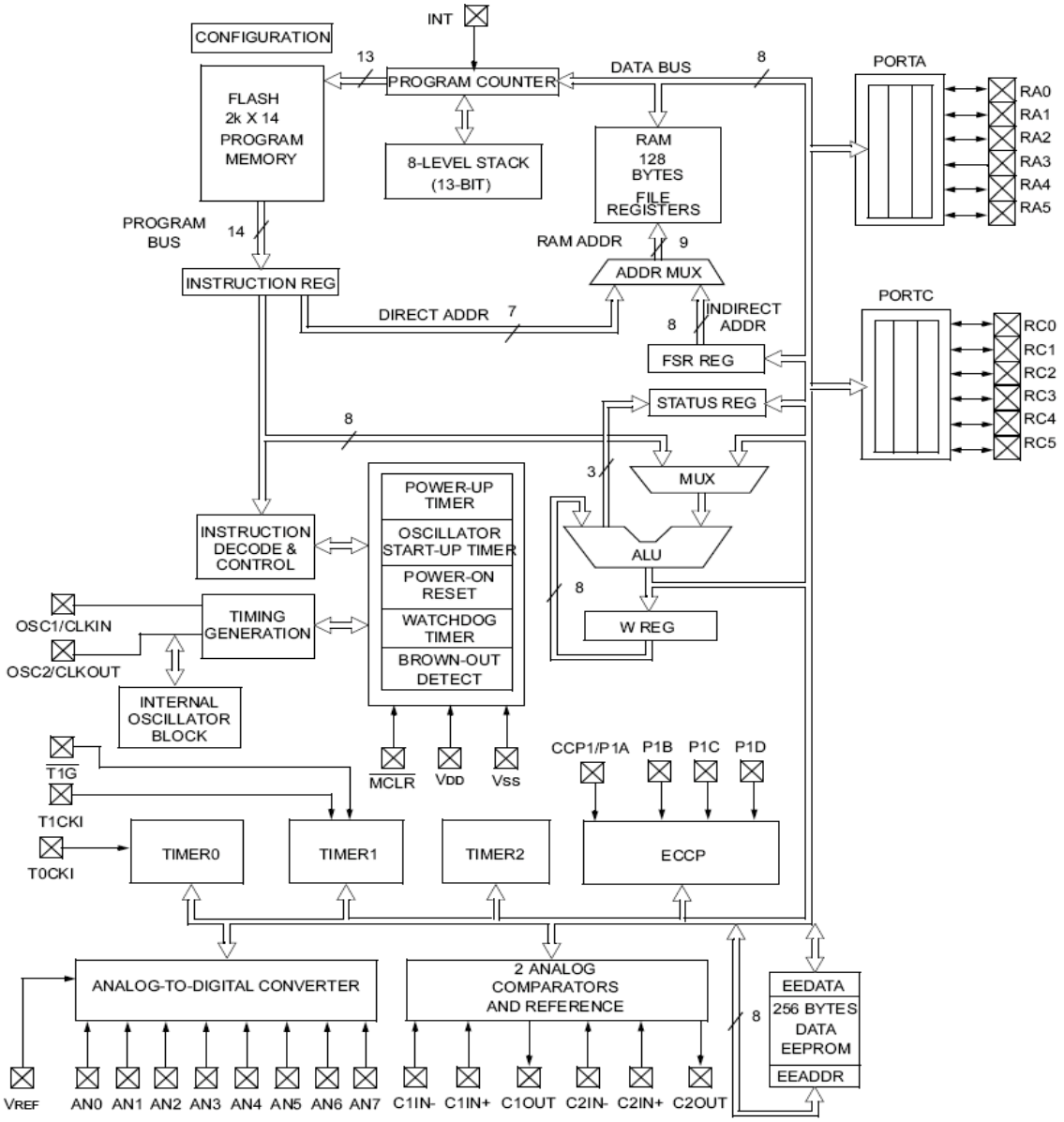
Spring 2013

Lecture 23: Key Questions
April 1, 2013

1. Explain the major differences between a microprocessor and a microcontroller, including the typical features of a microcontroller.

2. Explain the major benefits and limitations of using a microcontroller.

3. Explain the general components of the PIC 16F684 block diagram shown below.



4. Briefly explain why the PIC 16F684 has so few pins and how they can be used to access all of the components shown above.

5. What is the difference between Harvard and von Neumann memory architectures?

6. Explain the basic organization of the PIC data memory.

7. Explain the purpose of the PCL and PCLATH registers.

8. Briefly describe the contents of the STATUS register.

9. Explain the basic organization of the PIC stack.

10. Explain how different memory banks are accessed in PIC microcontrollers, and what the general function of each bank is.

11. Explain direct addressing on the PIC microcontrollers.

12. Example: What address on the PIC16F684, which has 2 banks, is being accessed if:

- STATUS = 60h, instruction = 031Fh?

- STATUS = 40h, instruction = 1F02h?

- STATUS = 13h, instruction = 0793h?

- STATUS = EEh, instruction = 03F1h?

13. Explain indirect addressing on the PIC microcontrollers.