# Final study guide:

# March 23:

- 1. Describe GALS in terms of clock domains.
- 2. What specific characteristic of an FPGA is required to utilize a MetaWire network?
- 3. Give one advantage for using a MetaWire network.
- 4. What simplifications are made by the simple NoC over the virtual channel NoC.
- 5. How does the simple NoC avoid Deadlocks?

# March 25:

- 6. List several features/advantages of FWIRE:
- 7. List any disadvantages of FWIRE
- 8. What the benefits of Tunable (Adjustable) Body Biasing?
- 9. What is energy harvesting?
- 10. List advantages for using Supercapacitors in energy harvesting systems:
- 11. List some environmental sources for energy harvesting:

# March 27:

- 12. List advantages for using MEM:
- 13. What is the most expensive part of designing a MEMS? How could that cost be reduced:
- 14. List wireless sensor application domains
- 15. What limiting design factors must be considered when developing WSNs?
- 16. What system design requirements must be considered when designing airbags and occupant classification systems?

# March 30:

- 17. What are Instruction-Set Extension?
- 18. What kind of improvements to the metrics of embedded systems does the use of Instruction-Set extensions provide and why?

# April 1:

- 19. What are the advantages of using reconfigurable computing for embedded security?
- 20. Why does the heuristic approach for intrusion detection work well for embedded systems?
- 21. What are the advantages and disadvantages of using a hardware-based monitoring system for secure embedded processors?
- 22. What are the specific objectives of a counter attack security mechanism?

## April 3:

- 23. The two main area models for reconfigurable devices are 1D and 2D models. What are the advantages and disadvantages of each?
- 24. What are two important design constraints to consider during hardware/software partitioning:
- 25. What is a partial runtime reconfigurable device? What advantages do they have over standard reconfigurable devices for implementation of a HW/SW partitioned embedded system?

## April 6:

- 26. What network features are expected so that the online HW/SW partitioning process works efficiently?
- 27. What is the main difference between partitioned scheduling and global scheduling with respect to where a task can be executed during its duration

### April 8:

- 28. Name several electronic systems design metrics that are important in space exploration missions?
- 29. List one advantage and one disadvantage of using microvias in circuit boards layouts:
- 30. Name one advantage MRAM has over SRAM?

### April 10:

- 31. What is the difference between a coarse grained FPGA and a fine grained FPGA
- 32. Why is measuring power dissipated during partial reconfiguration important?
- 33. List several advantages for using FPGAs as opposed to ASICs.

#### April 13:

- 34. How is the technique used to counter Code Injection Attack described in the IMPRES paper different from the techniques that existed prior to it (hint: IMPRES combined two previous techniques? List two advantages of this technique.
- 35. What are the advantages/disadvantages in trying to prevent reverse engineering?
- 36. How does TrustZone implement zone isolation?