

Register Number:

M.E DEGREE EXAMINATIONS: JUNE 2012

Second Semester

APPLIED ELECTRONICS

ANE506: Embedded Systems

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

1. Differentiate between requirements and specification.
2. How will you model the behavioral description of a system?
3. How would the ARM status word be after the following operation: $-2^{30} + 5 - 5$?
4. List out the reasons to use multiple buses and bridges in system bus design.
5. What is a Myrinet?
6. What is the data rate of a SHARC link port?
7. Define release time and deadline.
8. Differentiate between offline and online scheduling.
9. How does network OS differ from conventional OS?
10. List at least four RTOS.

PART B (5 x 16 = 80 Marks)

11. a) Compare and contrast top-down and Bottom-up design. With an example, explain how bottom-up information from I/O device hardware may be useful in refining the architectural design.

(OR)

- b) Write a detailed specification of a train Controller. List out all the classes and develop a class diagram. Use object diagram to instantiate objects in the complete system. Develop at least one sequence diagram to show system operation.

12. a) (i) Compare the unique architectural design features and data operations of ARM and SHARC Processors. (8)
- (ii) Write ARM assembly code to first read and then write a device memory mapped to location 0x2200. (8)

(OR)

- b) (i) Explain the elements of a ARM AMBA Bus. (8)
(ii) List out the different types of data operations that can be performed in a SHARC Processor. Illustrate each with an example. (8)

13. a) Draw the distributed embedded system block diagram and explain their hardware and software architectures.

(OR)

- b) (i) Explain the signals used during a transfer of a byte when using the I²C bus and also specify the format of the bits at the I²C bus with diagrams. (8)
(ii) What is a CAN Bus? How do CAN bus modules communicate? (8)

14. a) Explain the principles of weighted round robin approach also discuss the applicability of this method for a switched network.

(OR)

- b) (i) Prove that when preemption is allowed and jobs do not contend for resources, the EDF algorithm can produce a feasible schedule of a set J of jobs with arbitrary release times and deadlines on a processor if and only if J has feasible schedules. (8)
(ii) Write the challenges in validating constraints in priority driven systems. (8)

15. a) Explain the three alternative systems in the RTOS for responding to a hardware source call with appropriate diagrams.

(OR)

- b) (i) What are the task service functions supported by Vx Works? Explain the features of Vx Works. (8)
(ii) Explain the various RTOS Task scheduling models. (8)
