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B.E/B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2012

ELECTRONICS AND COMMUNICATION ENGINEERING

SIXTH SEMESTER (REGULATION 2008)

EC 9078 - EMBEDDED AND REAL TIME SYSTEMS

Time : 3 Hrs

Max. Mark : 100

Answer ALL Questions

PART-A

(10 x 2 = 20 Marks)

1. Draw the frame format of DCC for model train controller.
2. Write an ARM assembly code for the C assignment,  $Y=(C+D) * (E-F)$ .
3. What is the role of MLA instruction in ARM assembly language?
4. Enumerate the different steps in generating and porting an execution file into Target platform.
5. List out the methods of power optimization for OS.
6. What is meant by "Context switching"?
7. Give any two practical applications for distributed embedded computing.
8. Draw the IP service stack.
9. What is meant by system on silicon?
10. What is the significance of loop back testing in the design of software modem?

PART-B

(5 x 16 = 80 Marks)

11. (i). With neat sketches, explain the hardware architecture of set top box. (8)
- (ii). Briefly explain the requirements and algorithm for implementing a data compressor. (8)

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12.a)(i) With relevant sketches, explain two stage address translation of memory management unit. (8)

(ii) Explain in detail two level cache system and elaborate the two methods of cache implementation in ARM processor. (8)

(OR)

12.b) With a neat block diagram, briefly explain the dataflow model and its associated registers available in the ARM processor. (16)

13.a)(i) Explain in detail the architecture of logical analyzer and how logical analyzers are used for debugging and testing an embedded application. (8)

(ii) With a neat diagram, explain the working principle of touch screen. (8)

(OR)

13.b) (i). For the given code segment, perform the single assignment form and also draw the data flow graph. (8)

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X=A+B;  
Y=C+D;  
Z=X+E;
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(ii) Explain about loop unrolling and loop fusion in detail with an example for each. (8)

14.a)(i) Discuss in detail how Advanced Configuration And Power Interface (ACPI) provides effective power management services. (8)

(ii) Briefly explain about cooperative multitasking. (8)

(OR)

14.b)(i). Explain the different communication mechanisms among the processes in an operating system (8)

(ii). Briefly explain about preemptive multitasking. (8)

15.a) With relevant illustrations explain the architecture of Video Accelerators. Elaborate in detail component design and system testing of the same. (16)

(OR)

15.b)(i) With a neat diagram, explain the typical bus transactions on the I<sup>2</sup>C Protocol. (8)

(ii) With a practical example, explain about internet enabled system. (8)

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