Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 21425

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Eighth Semester

Electronics and Communication Engineering

EC 2042/EC 801 — EMBEDDED AND REAL TIME SYSTEMS

(Regulations 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the average memory access time of a machine whose hit rate is 93% with a cache access time of 5ns and a main memory access time of 80ns?

2. Distinguish between requirement and specification.

3. What is a bridge? Where it is applied?

4. Draw the data flow graph for the block shown below.

   r = a + b – c;
   s = α * r;
   t = b – d;
   r = d + e;

5. What is a semaphore?

6. Which should have lower overhead – a preemptive or cooperative context switch mechanism?

7. State the need for accelerators.

8. Differentiate between fixed priority arbitration and round – robin arbitration.

9. What skills are required to design a set-top box?

10. State the need for hardware – software Co-Design.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Develop the requirement, specification and state diagram of a model train controller. (12)

(ii) Implement the C switch statement in ARM. (4)

Or

(b) (i) With the help of a program segment explain how characters are copied from input to output using interrupts and buffers. (8)

(ii) Explain about caches and memory management units. (8)

12. (a) (i) With a suitable example explain how Logic analyser, In circuit emulator and Co-simulator are used as debugging tools. (12)

(ii) Explain about touch screens. (4)

Or

(b) (i) Discuss about the design pattern, loop transformation and scheduling. (12)

(ii) Write about clear box testing. (4)

13. (a) (i) Explain why an automobile engine requires multirate control. (4)

(ii) With suitable example explain the Earliest – Deadline – First – scheduling. Compare its performance with other scheduling algorithms. (12)

Or

(b) Write briefly about the Interprocess communication, context switching and power optimization strategies for processes.

14. (a) Explain the accelerated system design process with the suitable example.

Or

(b) (i) Explain the working of CAN Bus and Ethernet. (10)

(ii) With a suitable example explain the operation of Internet enabled system. (6)

15. (a) Describe the working Data compressor and PDA.

Or

(b) Briefly explain about Set-top box and Foss tools for embedded system development.

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