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06CS74

Seventh Semester B.E. Degree Examination, June/July 2013
Embedded Computing Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are major hardware units and devices in an embedded system? **(10 Marks)**

b. With the help of a neat diagram, explain the process of converting a C program into the file for ROM image. **(10 Marks)**

2 a. Explain with a neat diagram, the design process involved in an embedded system development. **(10 Marks)**

b. List various design challenges faced in designing an embedded system and methods to meet these challenges, with specific examples. **(10 Marks)**

3 a. List advantages and disadvantages of data transfer using serial and parallel ports. **(10 Marks)**

b. With a neat diagram, explain UART communication that uses handshaking signals. **(10 Marks)**

4 a. Explain the working of busy and wait transfer, highlighting its advantages. Mention a few applications where this method is used. **(10 Marks)**

b. Describe DMA transfer in an embedded system, with the help of a neat diagram. List the advantages of DMA transfer over interrupt driven transfer with a numeric example. **(10 Marks)**

PART – B

5 a. Give reasons for unfolding SDFGs into as many HSDFG (Homogeneous Synchronous Data Flow Graph) as feasible and then HSDFGs into as many APEGs (Acyclic Precedence Expansion Graph) as possible, with illustrations. **(10 Marks)**

b. What are the problems in modeling the processing of instruction in a multiprocessor system? Explain with an example of 2 processors PA and PB interfaced with the memory. **(10 Marks)**

6 a. What are various memory management strategies of an RTOS? **(10 Marks)**

b. Explain at least ten design principles when using an RTOS. **(10 Marks)**

7 a. What are various methods of saving and optimizing memory space in an embedded system? **(10 Marks)**

b. What are various performance metrics for an RTOS? **(04 Marks)**

c. Write important security functions required for RTOS security. **(06 Marks)**

8 a. Explain key features of simple target system with the help of a neat diagram. **(06 Marks)**

b. What are various OS porting issues in an embedded plat form? **(09 Marks)**

c. What are various subunits of back support hardware package and In-Circuit Emulator(ICE)? **(05 Marks)**

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