Printed Pages – 3

TCS – 044

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0672 Roll No. | | | | | | | | | |

B.Tech.

(SEM VIII) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

EMBEDDED SYSTEMS

Time : 3 Hours *Total Marks : 100*

Note : *Attempt **all** questions as per directions given thereof. All questions carry **equal** marks. Be precise in your answer. **No second** answer book will be provided.*

1. Attempt **any two** parts of the following :

(a) Mobile/handheld devices are examples of an embedded system. Justify.

(b) List the hardware units that must be present in the embedded systems and explain their functions.

(c) Explain the different program layers in the embedded software and also the process of converting a "C" program into the file for ROM image with suitable block diagrams.

2. Attempt **any two** parts of the following :

(a) Why is it that real time system development process is more complex ? Justify your answer with examples. Explain different characteristics of Real-Time architecture for embedded applications with some examples.

(b) Describe the different rules that an interrupt routine adhere to in an RTOS environment.

(c) What are the advantages offered by an FPGA, ASIC and ASIP for designing an embedded system ?

3. Attempt **any two** parts of the following :

(a) Why do we need multiple actions and multiple controlling tasks for the devices in an embedded system ? Explain it with an example of embedded system.

(b) What are the various models used in the design of an embedded system ? Why is it so hard to define embedded system ? Explain.

(c) Design a distributed embedded system for a microwave oven. You will write use cases and scenarios, draw sequence diagrams, design interfaces and behaviors, and check traceability. Consider a microwave oven with a simplified interface, such as one that might be placed next to a food vending machine. The oven has a door, a number of preprogrammed cooking buttons, a "done cooking" bell, and a cancel button. The buttons are the only way to control cooking time. The general idea is that each cooking button corresponds to an item in a vending machine, so you might press a button to pop a bag of popcorn, next button to heat a noodle cup, and so on.

4. Attempt **any two** parts of the following :

(a) What should be the goal during an embedded system development process ? How does it vary from the software development process ?

(b) What is sophisticated multitasking embedded system ? Why do you need at least one timer device in an embedded system ?

(c) What are the most important features in C language that makes it a popular high level language for an embedded system ? Why do you use infinite loop in embedded system software ?

5. Attempt **any two** parts of the following :

(a) Fundamentally, it is impossible to have a perfect, common distributed time in an embedded system. Discuss. How are the queues used for a network ?

(b) Draw and explain basic system (ACVS) of an Automatic Chocolate Vending Machine.

(c) A hardware engineer designing an embedded system must clearly understand the features of the new sophisticated devices, interface circuits and their speed of operation, and buses for networking the devices. Justify the statement with suitable example.

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