

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER– II • EXAMINATION – SUMMER 2014

Subject Code: 2725201**Date: 16/06/2014****Subject Name: System Design****Time: 2:30 PM to 5:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Describe in detail with examples about the embedded systems in (a) Home Environment and (b) Office Environment **07**

(b) Define a Real Time Embedded System and describe its characteristics. **07**

Q.2 (a) Explain the effect of current loops causing mutual inductance? **07**

(b) Explain the Characteristic Impedance property of transmission lines on the hardware board for signal transmission. **07**

OR

(b) Explain the effect of noisy signals in high speed design and list out the rules to keep away the noise effects away from the high speed design. **07**

Q.3 (a) Explain in detail the following: **07**

- Single Layer PCB
- Double Layer PCB
- Multi Layer PCB

(b) Explain in about the decoupling at (a) IC level and (b) Board Level **07**

OR

Q.3 (a) Explain in detail the following PCB Manufacturing steps: **07**

Base material cutting

- Drilling
- Through hole plating
- Layer film generation
- Solder resist film generation
- Laminating
- Exposing
- Spray developing
- Etching process

(b) Explain in detail about the Floating Point and Fixed Point Data formats. **07**
Mention the advantages and the limitation of a Fixed Point DSP processor.

Q.4 (a) Explain in detail about the SPI Bus Interface and the generic software support for the SPI devices. **07**

(b) Explain in detail about the I2C Bus Interface and the generic software support for the I2C devices. **07**

OR

Q.4 (a) Explain in detail about the Fixed Point and Floating Point data formats. **07**
Explain the major advantages and disadvantages of Fixed Point Processors over Floating Point Processors.

(b) Explain the following I/O data transfer techniques: **07**

- Program Driven I/O Transfer
- Interrupt Driven I/O Transfer
- Direct Memory Access I/O Transfer

Q.5 (a) Explain in detail with a sample C program for configuring the GPIO pin as digital output and as a digital input. **07**

Explain the procedure for controlling the LED connected to the GPIO pin of a microcontroller device.

(b) Explain the significance of a Timer in a microcontroller and explain the basic features a typical timer available on a microcontroller. **07**

Explain the following:

- Prescaler
- Timer Register
- Capture Register
- Compare Register

OR

Q.5 (a) Explain in detail about the basic components of any typical real time embedded system **07**

(b) Provide an overview of the following: **07**

- Compiler
- Assembler
- Linker
- Debugger
- Linker Command File
