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APJ Abdul Kalam Technological University

First Semester M.Tech Degree Examination December 2016

Ernakulam II Cluster

ELECTRONICS AND COMMUNICATION ENGINEERING

VLSI and Embedded Systems

Time: 3 hrs. **05EC 6007–EMBEDDED PROCESSORS** Max. Marks:60

I. 12 Marks

a) How the DSP processor is advantageous in signal processing? (4 Marks)

b) Draw the interrupt multiplexing scheme of TMS320F28335 DSP processor. (4 Marks)

c) Why CAN bus is highly immune to noise? Why CAN arbitration is in the device ID itself?(4 Marks)

II 12 Marks

a) Show an FIR filter is inherently stable. Draw the FIR filter structure showing delays. (4 Marks)

b) How the property of the filter can be changed by changing the window function? (4 marks)

c) Design and implement an FIR filter with band stop at 2700Hz using C Program. A coefficient file which contains 89 coefficients, represents an FIR band stop (notch) filter centered at 2700Hz is included. (4 marks)

III 18 Marks

a) Compare CISC and RISC features. (3 Marks)

b) Draw the ARM dataflow model.What are the various stages of a 3 stage pipe line of ARM7? (7 Marks)

c) How NVIC handles interrupt from different sources? (8 Marks)

OR

IV 18 Marks

a) What are the processor modes? How the mode switching is done?How to enter in to the protected mode of operation? (7 Marks)

b) In ARM7 processor show the instruction execution and PC status. (5 Marks)

c) In ARM processor (LPC1769) show the clock generation for different modules from the available oscillators. (6 Marks)

V 18 Marks

a) Draw and explain FPA10 architecture. Write the number 2001 in 32-bit binary, binary-coded decimal, ASCII and single-precision floating-point notation. (8 Marks)

b) Describe and differentiate between production VLSI testing, printed circuit board testing and system debugging, and describe how a JTAG test port may be used to address each of these. Where the JTAG approach is most effective and where is it least effective? (10 Marks)

OR

VI 18 Marks

a) Show how the following data is organized in ARM memory:(5 Marks)

```
struct SI {char c; int x;}; struct
S2 {
        char c2[5];
        SI si [2]; }
example;
```

b) What are the problems addressed by Advanced Microprocessor Bus Architecture address and the ARM reference peripheral specification? How might they be related? (5 Marks)

c) Sketch a system development plan for an embedded system chip showing at which stage the ARMulator, AMBA, the reference peripheral specification, Embedded-ICE and JTAG are used to assistin the development process and designed into the chip. (8 Marks)