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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Seventh Semester, B.E. - Information Science and Engineering
Semester End Examination; Dec. - 2014
ARM Based System Design

Time: 3 hrs

Max. Marks: 100

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

PART - A

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| 1. a. Briefly explain the AMBA bus Protocol. | 7 |
| b. Discuss the concept of Pipeline in ARM Processor. | 8 |
| c. Write a short note on ARM processor families. | 5 |
| 2 a. Explain the different data processing instructions in detail with suitable example. | 14 |
| b. With an example explain the concept of saturated arithmetic. | 6 |
| 3 a. Bring out the salient features of profiling and cycle counting in ARM simulator. | 5 |
| b. With an example of your choice explain the concept of unrolled counted loops. | 8 |
| c. With a suitable example explain how to handle unaligned data in ARM architecture. | 7 |
| 4 a. Explain the three stages of the logarithm calculation in detail. | 10 |
| b. Explain in detail how to calculate unsigned 32\32-bit divide by Newton-Raphson method. | 10 |

PART - B

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| 5 a. With a neat diagram, explain the non nested interrupt handler. | 10 |
| b. Briefly explain exception priorities. | 5 |
| c. Write a short note on vector table. | 5 |
| 6 a. Explain the concept of measuring Cache efficiency. | 6 |
| b. Discuss the Cache line replacement policies and explain any one briefly with a suitable example. | 8 |
| c. Explain the cleaning process for the D-Cache using the Test clean command. | 6 |
| 7 a. How do we set the region cache and write buffer attributes? Briefly explain. | 8 |
| b. Explain region assignment using a memory Map with a suitable example. | 8 |
| c. Write short notes on memory organization in a virtual memory system. | 4 |
| 8 a. With a help of neat circuit diagram explain the following: | |
| (i) Single-step page table walk | 12 |
| (ii) Two-step page table walk. | |
| b. Briefly explain the Fast context switch Extension (FCSE) with a suitable example. | 8 |