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10CS72

Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Embedded Computing System

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. What is an embedded system? Differentiate between a general purpose computer and an embedded system. (04 Marks)
- b. Explain the design of a requirement form for the beginning of project. (08 Marks)
- c. Discuss various challenges in embedded computing system design. (08 Marks)

- 2 a. Differentiate between:
 - i) Cache hit and cache miss with a neat diagram. (04 Marks)
 - ii) LDRH and LDRB of ARM instructions. (08 Marks)
- b. What is an interrupt? Explain the mechanism of interrupt vectors with a neat diagram. (08 Marks)
- c. Write ARM assembly code to implement the following C statement:
 $Z = (a < 2) \mid (b \& 15)$. (04 Marks)
- d. What is pipeline? Explain the stages in an ARM pipeline. (04 Marks)

- 3 a. Explain the following terms: i) Bus master; ii) Four-cycle handshake protocol; iii) Components/signals on a bus; iv) DMA. (12 Marks)
- b. Explain, how bridge can be used to connect different speeds systems. (08 Marks)

- 4 a. Explain three techniques used in loop optimization. (10 Marks)
- b. Explain the role of assembles and links in the compilation process with a neat diagram. (07 Marks)
- c. What is dead code elimination? Explain. (03 Marks)

- PART - B**
- 5 a. What is a process? What is Kernel? Explain any three services of the Kernel in an operating system. (08 Marks)
- b. Compare thread v/s process. (07 Marks)
- c. Define the following terms: i) CPU utilization; ii) Throughput; iii) Turnaround time; iv) Waiting time; v) Response time. (05 Marks)

- 6 a. Explain the working of a shared memory communication system with a neat diagram. (08 Marks)
- b. List various assumptions done during the evaluation of operating system performance. (04 Marks)
- c. Explain the following with respect to IPC: i) signals; ii) mail-boxes. (08 Marks)

- 7 a. With a neat diagram, explain CAN data frame format. (10 Marks)
- b. Explain the basic format of an IP packet. (10 Marks)

- 8 Explain the following file types generated during cross-compiling/assembling:
 - i) .obj File
 - ii) .Map File
 - iii) .Hex File
 - iv) .lst File. (20 Marks)

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1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. $4+6=10$, will be treated as malpractice.