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.
        ii) LDRH and LDRB of ARM instructions.   **(04 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:
        $Z = (a << 2) | (b \& 15)$.   **(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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