I Semester [VLSI Design & Embedded Systems]

USN | | | | | | | | | | |

12EC118

M.Tech. Degree Examination, Dec.2013/Jan.2014
Advanced Embedded System

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Distinguish between Big-Endian and Little-Endian processors, with an example. **(06 Marks)**
b. Explain the different types of RAM used for embedded system design. **(08 Marks)**
c. Describe the role of Brown-Out protection circuit. **(06 Marks)**

2 a. Explain the operation of the 12C on-board communication interface; with a discussion on the sequence of operations required. **(08 Marks)**
b. Discuss ZigBee network model. **(06 Marks)**
c. Explain the important operational quality attributes to be considered in any embedded system design. **(06 Marks)**

3 a. Compare dataflow graph (DFG) and control data flow graph (CDFG) model. **(06 Marks)**
b. Design an embedded system for driver/passenger 'seat belt warning' in an automotive using FSM model implement wait state using timer. **(08 Marks)**
c. What is UML? What are the fundamental building blocks of UML? Explain sequence diagram, with an example. **(06 Marks)**

4 a. Discuss "super-loop" based embedded firm ware design. **(06 Marks)**
b. With a neat diagram, explain the conversion process of a high level language to machine language. Also explain the advantages of high level language based development. **(10 Marks)**
c. What is "inline assembly"? **(04 Marks)**

5 a. Explain the round robin process scheduling. **(06 Marks)**
b. Three processes P_1, P_2, P_3 with estimated completion time 10, 5, 7 ms respectively enters the ready queue together. Calculate Waiting Time (WT) and Turn Around Time (TAT) for each process. Also calculate average WT and average TAT in SJF (Shortest Job First) algorithm. **(08 Marks)**
c. Differentiate between threads and processes. **(06 Marks)**

6 a. What is dead lock? Explain Coffman conditions favoring dead locks. **(06 Marks)**
b. What is semaphore? Compare 'binary semaphore' and 'counting semaphore'. **(06 Marks)**
c. Describe the role of device driver in the OS context. **(08 Marks)**

7 a. List down the features of simulator based debugging and also discuss the advantages of simulator firmware debugging. **(06 Marks)**
b. Explain the 'Boundary Scan' based hardware debugging. **(08 Marks)**
c. Describe the role of 'Monitor program' in firmware debugging. **(06 Marks)**

8 Write short notes on:
a. RPC (Remote Procedure call).
b. PLD (Programmable Logic Devices).
c. Java for embedded development.
d. Object-Oriented Model. **(20 Marks)**

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