Digital Electronics

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

12EC118

M.Tech. Degree Examination, June/July 2013
Advanced Embedded Systems

Time: 3 hrs. Max. Marks:100

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

1 a. Differentiate between:
i) RISC and CISC
ii) Big-Endian and little Endian processors / controllers. **(08 Marks)**
b. Explain the different classification of working memory (RAM). **(06 Marks)**
c. Explain the various methods available for developing the embedded firmware? Mention the development environment used for the firmware design. **(06 Marks)**

2 a. Write a brief note on:
i) Reset circuit.
ii) Brown-out protection circuit. **(08 Marks)**
b. List the important characteristics of an embedded system. Explain any one. **(04 Marks)**
c. Explain the non-operational quality attributes. **(08 Marks)**

3 a. Mention the different computational models in embedded system. Explain any two. **(07 Marks)**
b. What are the fundamental building blocks of unified modeling language? Explain what are the unified modeling language tools used. **(06 Marks)**
c. Explain the tasks and execution of functions in a sequential program model for the seat belt warning system. **(07 Marks)**

4 a. Explain the high level language based embedded firmware development. Mention few advantages. **(08 Marks)**
b. Explain the different embedded firmware design approaches in detail. **(08 Marks)**
c. Write a short note on mixing assembly with high level language. **(04 Marks)**

5 a. Differentiate between monolithic kernel and micro kernel. **(04 Marks)**
b. Three processes with process IDs, P_1, P_2, P_3 with estimated completion time 10, 5, 7 milliseconds respectively enters the ready queue together in order P_1, P_2, P_3. Calculate the waiting time and turn around time for each process, the average time (waiting) and turn around time (assuming there is no I/O waiting for the processes). **(10 Marks)**
c. Explain Round Robin process scheduling with interrupts. **(06 Marks)**

6 a. Explain what are all the factors needs to be analysed carefully before making a decision on the selection of an RTOS. **(08 Marks)**
b. What is priority inversion? Mention the merits and demerits of priority ceiling. **(05 Marks)**
c. Explain the different conditions favouring a deadlock situation. **(07 Marks)**

7 a. Explain the role of integrated development environment (IDE) for embedded software development. **(06 Marks)**

b. What are the different files generated during the cross-compilation of an embedded C file? Explain them in detail. **(10 Marks)**

c. What is the difference between a simulator and an emulator? **(04 Marks)**

8 a. Explain the boundary scan based hardware debugging in detail. **(08 Marks)**

b. Write a brief note on:

i) Java for embedded development.

ii) Open moko.

iii) Bottlenecks. **(12 Marks)**

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