Eighth Semester B.E. Degree Examination, May/June 08
Real Time Systems

Time: 3 hrs.   Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. What are the issues to be considered in real time computing? Explain any 2 examples for real time computing or processing.   **(08 Marks)**
   b. Differentiate between the following:
      i) Periodic and a periodic tasks
      ii) Critical and non – critical tasks
      iii) Reliability and Availability.   **(06 Marks)**
   c. Write the structure of a real time system and explain its working.   **(06 Marks)**

2 a. With a block schematic and timing diagram, explain the working of a 2stage pipeline and estimate the time required for any one special case.   **(08 Marks)**
   b. Discuss "performability" in a real time system.   **(06 Marks)**
   c. Explain how the source code can be analysed for determining the execution time. **(06 Marks)**

3 a. Explain RM (Rate Monotonic) scheduling algorithm with an example and equation.
                                                                                       (08 Marks)
   b. Write an optimal scheduling algorithm (IRIS1) for the case when the mandatory portions of all tasks are not all zeroes.   **(08 Marks)**
   c. Describe a bin packing assignment algorithm for EDF (Earliest Deadline First).   **(06 Marks)**

4 a. Describe VTCSMA protocol's algorithm with a flowchart and notations used.   **(08 Marks)**
   b. Differentiate between
      i) Packet switching and circuit switching
      ii) Hierarchical RR protocol and polled bus protocol.   **(06 Marks)**
   c. Prove the theorem:
      "In the absence of failures, the maximum cycle time of the token is no greater than twice the TTRT". Explain for two typical cases.   **(06 Marks)**

5 a. Explain fault tolerant synchronization in H/W for VCO with a phase locked loop.
                                                                                       (08 Marks)
   b. Describe the analysis of clock with necessary equation and figures.   **(06 Marks)**
   c. Explain CNA algorithm used for software synchronization. What is its major drawback?
                                                                                       (06 Marks)

6 a. Explain co – operative scheduling of ready tasks using an ordered list as per precedence constraints.   **(08 Marks)**
   b. List the functions and activities of an RTOS.   **(06 Marks)**
   c. Mention the various security functions and activities in an operating system.   **(06 Marks)**

7 a. What are the important features of VX works for a sophisticated embedded system design?
                                                                                       (08 Marks)
   b. Mention the RTOS system level functions in MUCOS and explain any two of them.
                                                                                       (06 Marks)
   c. List the features of MUCOS.   **(06 Marks)**

8 a. Describe the design of "Automatic chocolate vending machine", with block schematics and specifications.   **(10 Marks)**
   b. Explain the case study on "coding for sending application layer byte stream on a TCP/IP network using Vxworks".   **(10 Marks)**

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