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10MT761

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022
Real Time Systems

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Define real time system? Explain the computer control system showing communication tasks with the block diagram. **(10 Marks)**
   b. Explain : (i) Clock based tasks   (ii) Event based tasks. **(06 Marks)**
   c. Explain the sequential programming and multitask programming. **(04 Marks)**

2 a. Explain the sequence control by taking the example of a simple chemical reactor vessel. Show the block diagram of a typical chemical batch process. **(10 Marks)**
   b. Explain hierarchical systems with neat sketches and explain the same with an example. **(10 Marks)**

3 a. Write the block diagram of an interrupt vectoring using priority encoding circuit and explain. Show the timing diagram of a simplified READ operation. **(10 Marks)**
   b. Explain with a neat diagram analog output system. **(06 Marks)**
   c. Drawn single chip computer and explain. **(04 Marks)**

4 a. Explain the following:
      (i)   Security
      (ii)   Readability
      (iii)   Efficiency. **(09 Marks)**
   b. Explain subrange data types. **(06 Marks)**
   c. Explain exception handling and coroutines. **(05 Marks)**

PART – B

5 a. Explain the scheduling strategies. **(06 Marks)**
   b. List the functions of task management. Explain task states with a task state diagram. **(08 Marks)**
   c. Explain : (i) Task chaining and swaping   (ii) Task overlaying. **(06 Marks)**

6 a. What is code sharing? Explain serially reusable code and reentrant code. **(08 Marks)**
   b. Explain mutual exclusion using binary semaphore. **(07 Marks)**
   c. Explain : (i) Livelock   (ii) Dead lock   (iii) Indefinite postponement **(05 Marks)**

7 a. Explain planning phase as related to design of RTS. **(05 Marks)**
   b. Write a flow chart for a single programming approach. **(05 Marks)**
   c. Consider a system comprising of several hot air blowers. Prepare a specificator document of the same (Assume planning phase has been completed). **(10 Marks)**

8 a. Explain with relevant diagrams about the context diagram for drying oven. **(08 Marks)**
   b. What is Yourdon methodology? Explain. **(05 Marks)**
   c. Differentiate between Ward and Mellar and Hatley and Pirabhai methodologies architecture model with relevant diagram in case of Hatley and Pirabhai method. **(07 Marks)**

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