USN

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Embedded Computing Systems

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Define embedded system. Explain the embedded system design process. **(06 Marks)**
   b. Explain the hardware and software architecture for the moving map display. **(06 Marks)**
   c. Write the sequence diagram for transmitting a control input in model train controller.
   (08 Marks)

2 a. What is the difference between the Harvard and von Neumann architectures? **(06 Marks)**
   b. Explain the basic ARM programming model. **(06 Marks)**
   c. Write the UML collaboration diagram for the data compressor. Explain Huffman coding for text compression. **(08 Marks)**

3 a. Define a bus. Explain with a neat diagram bus with a DMA controller. **(06 Marks)**
   b. With a neat sketch explain the internal organization of a memory device. **(06 Marks)**
   c. Explain :   i) Timers and controller   ii) A/D and D/A converter
                   iii) Key board   iv) Display. **(08 Marks)**

4 a. Discuss models of program in design and analysis. **(06 Marks)**
   b. Explain program optimization techniques. **(08 Marks)**
   c. Explain program level performance analysis. **(06 Marks)**

PART – B

5 a. Explain the architecture of RTOS with suitable example. **(08 Marks)**
   b. Discuss process, threads and CPU metrics. **(06 Marks)**
   c. Briefly explain rate monotonic scheduling and earliest – Deadline first scheduling. **(06 Marks)**

6 a. Explain interprocess communication mechanisms. **(10 Marks)**
   b. Discuss the theory of operation and requirements in telephone answering machine.
   (10 Marks)

7 a. With a neat sketch, explain OSI model for network. **(08 Marks)**
   b. Explain distributed embedded architecture with a neat diagram. **(06 Marks)**
   c. Explain :
      i)   Internet applications
      ii) Internet security
      iii) Sensor networks. **(06 Marks)**

8   Write short notes on the following :
   b. Simulator and debugger
   c. BMW 850i brake and stability control
   d. Cache memory. **(20 Marks)**

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