B.E. Instrumentation Engineering (Model Curriculum) Semester-VIII
IN804M2 - Core Elective-II - Embedded System for Instrumentation

P. Pages : 2

Time : Three Hours

Max. Marks : 80

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Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.

1. a) What is an embedded system? And explain various characteristics of embedded system. **8**

b) Write some of the applications of embedded systems, and how these systems improve efficiency and productivity in various industries? **8**

OR

2. a) How we do the Memory Management in embedded system and what techniques are used for optimizing memory usage. **8**

b) What are some recent trends in embedded systems, and how are these trends shaping the future of this field? **8**

3. a) Illustrate the function perform by following instruction with example. **8**
   i) LDS.
   ii) STS
   iii) LDI

b) Explain the general purpose registers with data memory in AVR microcontroller. **8**

OR

4. a) Write down the note on Von Neumann Architecture and Harvard Architecture. **8**

b) Differentiate between. **8**
   i) Microcontroller and microprocessor.
   ii) RISC and CISC architecture.

5. a) Write down the note on: **8**
   i) I2C Protocol.
   ii) SPI Protocol.

b) For an 8-bit ADC, we have Vref=2.56v. Calculate the D0-D7 output if the analog input is a) 0.4v   b) 0.2v and how much is the variation between a) & b) **8**

OR

6. a) What is ADC in AVR microcontroller? And explain its working with example. **8**

b) Discuss a Watch-Dog Timer in a microcontroller what happens when it is triggered. **8**

| **7.** | a) | Explain PWM mode in timer 0 with diagram. | **8** |
| | b) | Explain Timers or Counters in microcontroller. | **8** |

OR

| **8.** | a) | Draw and explain serial port in microcontrollers. | **8** |
| | b) | Explain Power-down mode in microcontroller and how it is differ from other modes of operation. | **8** |

| **9.** | a) | Define semaphores, and how it is used in an RTOS environment. | **8** |
| | b) | What are the basic services provided by an operating system? | **8** |

OR

| **10.** | a) | How is data shared between tasks in an RTOS environment? | **8** |
| | b) | Draw and explain what is process management, and how is it implemented in an operating system. | **8** |

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